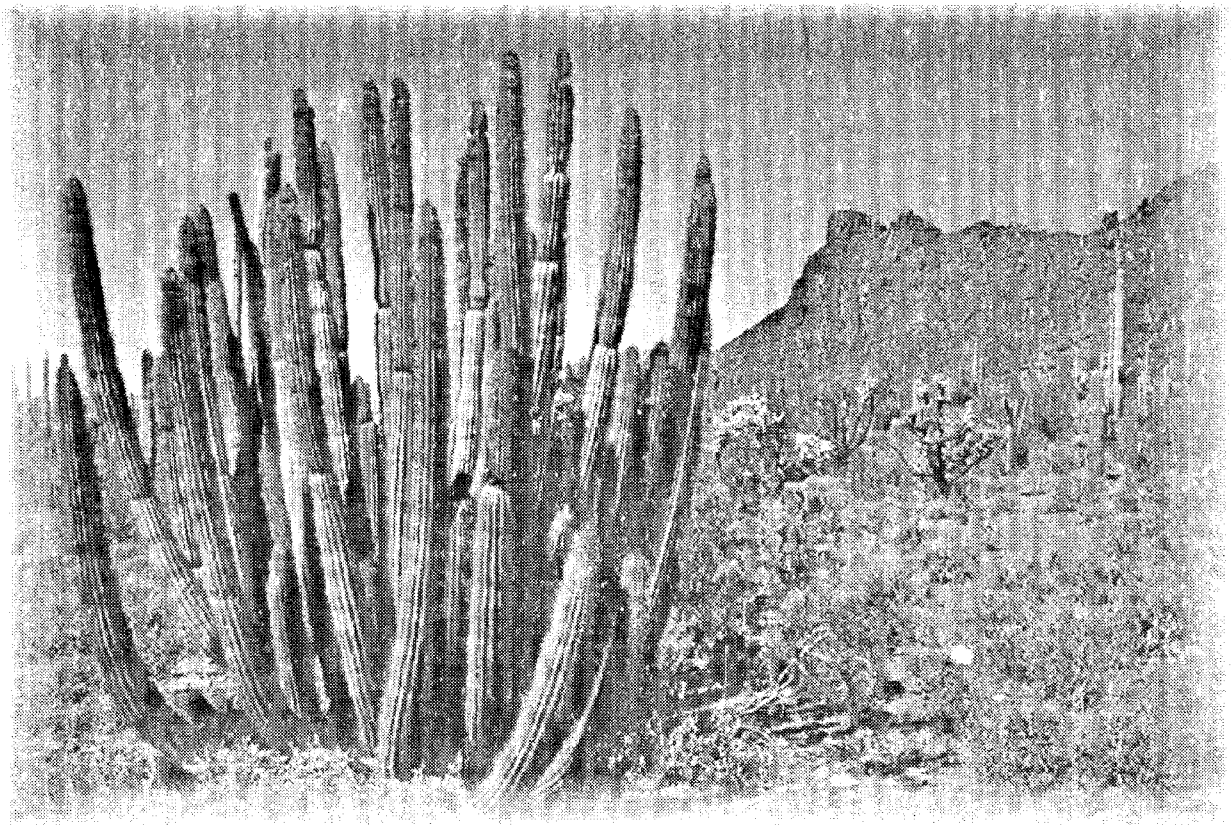


Draft Supplemental Environmental Impact Statement
Re-Analysis of Cumulative Impacts on the Sonoran Pronghorn



ORGAN PIPE CACTUS

National Monument • Arizona

**U.S. Department of the Interior
National Park Service
Re-Analysis of Cumulative Effects on the Sonoran Pronghorn
Supplement to the Environmental Impact Statement
For the
1997 General Management Plan/
Development Concept Plans
For
Organ Pipe Cactus National Monument**

Summary

At Organ Pipe Cactus National Monument, the National Park Service (NPS) is re-analyzing the cumulative impact of actions on the Sonoran pronghorn (*Antilocapra americana sonoriense*). The "cumulative impact" is the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions.

The Sonoran pronghorn is an endangered species that inhabits Sonoran desert habitats found primarily on federally-managed lands in southwestern Arizona, and in northern Sonora, Mexico. Current estimates indicate that approximately 100 pronghorn exist in the United States today. Factors threatening the continued survival of the pronghorn include lack of recruitment (survival of fawns), insufficient forage and/or water, drought coupled with predation, physical manmade barriers to historical habitat, illegal hunting, degradation of habitat from livestock grazing, diminishing size of the Gila and Sonoyta rivers, and human encroachment.

The NPS is re-analyzing cumulative impacts on the pronghorn in response to a court order ruling (civil action No. 99-927) that found the environmental impact statement (EIS) on the 1997 Organ Pipe Cactus National Monument General Management Plan/Development Concept Plans/Environmental Impact Statement (GMP/DCP/EIS) failed to address the cumulative impacts of activities on the pronghorn.

Past, present, and foreseeable future actions described in this supplement are being added to actions contained in the 1997 (GMP/DCP/EIS) and analyzed to assess cumulative impacts on the Sonoran pronghorn.

Under the New Proposed Action Alternative, the cumulative impacts of all Federal and non-Federal actions are likely to result in a continued, incremental reduction in the ability of Sonoran pronghorn to maintain a viable population in the United States. Although there are many beneficial actions included in this cumulative scenario, they are outweighed by adverse impacts.

Note to Reviewers and Respondents

If you wish to comment on this draft supplemental EIS, you may mail comments to the name and address below. Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. There also may be circumstances in which we would withhold from the record a respondent's identity, as allowable by law. **If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment.** We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Please address written comments to:
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Organ Pipe Cactus National Monument
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ABBREVIATIONS USED IN THIS REPORT

BLM	Bureau of Land Management
BMGR	Barry M. Goldwater (Air Force) Range
CPNWR	Cabeza Prieta National Wildlife Refuge
OPCNM	Organ Pipe Cactus National Monument
SEIS	Supplement to the Environmental Impact Statement
UDA	Undocumented Alien
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service

PURPOSE AND NEED

Purpose of this Supplement

The National Park Service (NPS) proposes to re-examine the cumulative impacts of actions on the Sonoran pronghorn that were presented in the 1997 Organ Pipe Cactus National Monument General Management Plan/Development Concept Plan/Environmental Impact Statement (GMP/DCP/EIS). The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act, define cumulative impacts as *"the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions"* (40 CFR 1508.7)

This supplement to the GMP/DCP/EIS is pursuant to a 12 February 2001, United States District Court for the District of Columbia ruling of *Defenders of Wildlife et al. vs. Babbitt, et al.* (Civil Action No. 99-927), which ruled that the NPS issued an environmental impact statement (in the General Management Plan) that failed to address the cumulative impacts of their activities on the Sonoran pronghorn, when added to other past, present, and reasonable foreseeable future actions, regardless of what agency undertakes those actions.

Environmental Issues

The issue that this supplemental EIS addresses is the Sonoran pronghorn. Sonoran pronghorn, one of five subspecies of the American pronghorn, have evolved in the unique Sonoran desert environment found in southwestern Arizona and northwestern Sonora, Mexico. Population estimates indicate Sonoran pronghorn have decreased from approximately 142 in the U.S. in 1998 (Bright et al. 1999) to approximately 99 in 2000 (AGFD unpubl. data.). In Arizona, Sonoran Pronghorn habit occurs only on federal lands. Besides NPS lands, pronghorn occupy lands managed by the United States Air Force and United States Marine Corp. (Barry M. Goldwater Range), the U.S. Fish and Wildlife Service (Cabeza Prieta National Wildlife Refuge), and the Bureau of Land Management. The Immigration and Naturalization Service and the United States Border Patrol also operate in the area of the pronghorn habitat, primarily along the United States – Mexican Border. Although agency lands are contiguous, each agency has a specific mission that presents varying management practices to meet agency goals.

Factors threatening the continued survival of the Sonoran subspecies include lack of recruitment (survival of fawns), insufficient forage and/or water, drought coupled with predation, physical manmade barriers to historical habitat, illegal hunting, degradation of habitat from livestock grazing, diminishing size of the Gila and Sonoyta rivers, and human encroachment (USFWS 1998).

History of the General Management Planning Process

A Draft GMP/DCP/EIS for the park was released for public review in May 1995. The draft contained two alternatives; Continuation of Existing Conditions, and The Proposed Action. After reviewing public comments on the draft document, the NPS determined that a supplement to the document was needed to broaden the range of reasonable alternatives and to respond to public concerns. In March 1996, a supplement to the Draft GMP/DCP/EIS was released for public review. The supplement contained two new alternatives, including the new proposed action. Together, the draft and the supplement contained a total of four alternatives. Both the Draft GMP/DCP/EIS and the supplement to the draft assessed the environmental consequences of all four alternatives and their general costs of implementation.

The Record of Decision for the Organ Pipe Cactus NM 1997 General Management Plan was signed on January 28, 1998. The Final GMP/DCP/EIS "... addresses the issues and changes affecting the

monument, and fulfills the legal requirements of the NPS to develop, make public, and execute a programmatic plan to guide management of the monument over 10-15 years." The Record of Decision documented that the "New Proposed Action Alternative" and the "Actions Common to All Alternatives" would be the approved set of actions that the NPS would implement over the next 15 years.

Formal Consultation on Endangered Species

During the general management planning process, the NPS entered into formal consultation with the United States Fish and Wildlife Service (USFWS) through its May 22, 1996 submittal of a biological assessment (Appendix A). The biological assessment examined the effects on four endangered species in the park, including the Sonoran pronghorn. The analysis of the Sonoran pronghorn indicated that there were no proposed actions in the GMP/DCP/EIS that would directly effect the pronghorn. However, it was found that increased visitor use may lead to indirect effects on the Sonoran pronghorn if human presence in the front- and backcountry causes an alternation in behavior and habitat use. The potential for increased traffic on Highway 85 was also examined. Past observations of pronghorn movements suggested that traffic along Highway 85 acts as a barrier to pronghorn, restricting their movements across the highway.

The biological assessment concluded that existing and future road conditions along state Route 85 would continue to act as a barrier to pronghorn movements. It stated that "... these actions may adversely affect Sonoran pronghorn if it leads to a reduction in genetic exchange and reduced viability, potentially eliminating populations from this portion of their range." The USFWS Biological Opinion concluded with a number of reasonable and prudent measures proposed to help reduce the impact on the Sonoran pronghorn (Appendix A).

The USFWS issued a biological opinion on the NPS assessment on June 26, 1997. The opinion stated that the plan was "...not likely to jeopardize the continued existence of the Sonoran pronghorn." Although the USFWS anticipated incidental take of Sonoran pronghorn would be difficult to detect, more than one Sonoran pronghorn death on Highway 85 would result in re-initiation of the consultation process on the general management plan. To date, no such incidental take has been known to occur. The USFWS also provided a number of terms and conditions that implement reasonable and prudent measures for the Sonoran pronghorn (Appendix A).

Summary of Scoping

History of Public Involvement

On February 27, 2001, agencies involved in the lawsuit met at the U.S. Fish and Wildlife Service office in Phoenix to discuss compilation of environmental baseline data for the Sonoran pronghorn. Agencies attending were: USFWS, Bureau of Land Management, Arizona National Guard, National Park Service, U.S. Marine Corps, U.S. Air Force, and a GIS contractor to the U.S. Air Force. Discussions involved the results of the litigation, action area, data needs, use of GIS to compile the data needs, and a review of existing environmental baseline information. On March 29, 2001 another meeting of agencies involved in performing environmental analyses remanded by the Court met at the Gila Bend Air Force Auxiliary Field in Gila Bend, Arizona. This meeting was organized by the U.S. Marine Corps, to coordinate the USMC's supplemental EIS with cooperating and other affected agencies. Discussions included the proposed schedule for the USMC SEIS, the study area, and projects to be considered in cumulative impacts. Attendees included the USMC, USFA, BLM, USFWS, NPS, Arizona Game and Fish Department, and the consulting firm URS.

The Notice of Intent (NOI) to prepare an environmental impact statement was published in the Federal Register on April 26, 2001. The NOI informed the public of a 30-comment period regarding preparation of this supplement. Concurrently, the NPS sent out 454 scoping letters to federal agencies, and affected or interested organizations and individuals informing them of the process, explaining the issues, and inviting

them to offer any comments on either. Fourteen letters were received on or before May 25, 2001, the day the comment period closed. Twelve letters offered comments on past, present, and future actions, while two letters contained addresses for future correspondence.

The comment letters focused mainly on present or ongoing actions that are believed to affect Sonoran pronghorn, including increasing use on State Route 85 and the 1997 speed limit increase (from 55 mph to 65 mph); cattle grazing on adjacent BLM lands; the increase/presence of undocumented aliens using the monument; Border Patrol impacts resulting from control of illegal border activities; adjacent military activities/practices; and increasing visitation, particularly in the backcountry. Additional comments include concerns over potential conservation actions that may impact commerce between Mexico and the United States; daily, on-going activities in Mexico that may have impacts on Sonoran pronghorn habitat; and suggestions on alternative Sonoran pronghorn management techniques.

These concerns have been evaluated in Appendices B-D and the results have been included in the cumulative effects analysis and conclusions sections of this document.

Scope of this Supplement

Pursuant to the court order, the NPS proposes to re-analyze the cumulative impacts on the Sonoran Pronghorn, of actions that were described in the approved GMP/DCP/EIS. The NPS does not intend to change or update the approved GMP/DCP/EIS in any way except to provide the court-ordered re-evaluation of the cumulative impacts on the Sonoran pronghorn. The NPS intends to use the date of the establishment of the monument, 1937, as a starting date for this re-analysis. The NPS does not propose to add, change, or delete any actions contained in the approved General Management Plan, nor does the NPS propose to add, change, or delete any other present or proposed park actions through this supplemental EIS. If changes to the GMP/DCP/EIS or any other approved park plan need to be made as a result of the findings of this supplement, a separate planning process will be initiated to address such changes.

This supplement re-examines the actions of two alternatives that were presented in the GMP/DCP/EIS: A) Existing Conditions/ No Action; and B) The New Proposed Action. In order to present the current environmental baseline at the park, Alternative A: No Action/Continuation of Existing Conditions, has been updated with those actions, authorized by the plan, that have either occurred since its approval, or are currently underway. Alternative B, The New Proposed Action Alternative, appears exactly as it did in the approved GMP/DCP/EIS (Table 1.). The impacts of actions on other topics are not discussed in this supplement because the court order specifically rules that the NPS re-analyze impacts on the Sonoran pronghorn.

In addition to determining the environmental consequences of the preferred and other alternatives, National Park Service policy (*NPS Management Policies, 2001*) requires analysis of potential effects to determine whether or not actions would impair park resources. An impact to any park resource or value may constitute an impairment. An impact would be more likely to constitute an impairment to the extent it affects a resource or value whose conservation is: 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents.

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. A determination on impairment is made in the "Environmental Consequences" section for each alternative.

Impact Topics Dismissed from Further Consideration

As stated in the purpose and need section, the scope of this supplement is limited to the cumulative impacts of actions on the endangered Sonoran pronghorn. Therefore, mandatory EIS impact topics that are dismissed from further consideration include:

- *Wilderness*
- *Air Quality*
- *Other Endangered or threatened plants and animals and their habitats (including those proposed for listing, or on state lists).*
- *Wildlife*
- *Vegetation*
- *Cultural Resources*
- *Visitor Use and Experience*
- *Socioeconomics and Socio-cultural characteristics.*
- *Possible conflicts between the proposed action and land use plans, policies, or controls for the area concerned (including local, state, or Indian tribe)*
- *Energy requirements and conservation potential*
- *Natural or depletable resource requirements and conservation potential.*
- *Urban quality, historic and cultural resources, and design of the built environment.*
- *Socially or economically disadvantaged populations.*
- *Wetlands, floodplains, and other water resources.*
- *Prime and unique agricultural lands.*
- *Important scientific, archaeological, and other cultural resources, including historic properties listed or eligible for the National Register of Historic Places.*
- *Ecologically critical areas, Wild and Scenic Rivers, or other unique natural resources.*
- *Public health and safety.*
- *Sacred sites.*
- *Indian Trust resources.*

ALTERNATIVES CONSIDERED

Alternative A, No Action/Continuation of Existing Conditions

This alternative constitutes a no-action alternative in terms of providing a "baseline" condition for comparison to the preferred alternative. This alternative contains the same actions as the approved GMP/DCP/EIS (Alternative 2, Continuation of Existing Conditions, renamed in the Supplement to the Draft GMP/DCP/EIS to Existing Conditions/No Action). However, in order to reflect the current park management program, this alternative also includes all programs, projects and actions that are currently underway, even if they are being implemented as a result of the approved GMP. However, actions proposed in the GMP that have not yet been implemented are not considered under this alternative. A more complete description of ongoing actions is included in Appendix A.

Alternative B, The New Proposed Action (Preferred Alternative)

The preferred alternative analyzed in this supplement is New Proposed Action Alternative described in the Supplement to the Draft GMP/DCP/EIS. This alternative appears exactly as it did in the supplement. This alternative was approved in the Final 1997 GMP/DCP/EIS as the proposed action.

A summary of the alternatives is contained in Table 1. Alternative A., Existing Conditions/No Action Alternative, has been updated with specific completed or ongoing projects. Those projects are listed in *italics*.

Table 1. Summary Comparative of Alternatives

TOPICS	Alternative A: EXISTING CONDITIONS/ NO ACTION ALTERNATIVE	Alternative B: NEW PROPOSED ACTION ALTERNATIVE
	This alternative is based primarily on continuing the existing course of action within the monument.	Constituting the NPS's proposed action, this alternative combines elements from the other alternatives to enhance visitor opportunities and resource preservation within the monument and the region, strengthens the monument's role as a Biosphere Reserve, and presents a cost-effective development strategy.
Land Use and Management		
Management Zones	<p>Retain the existing management zone system:</p> <p><u>Natural Zone</u>-largely unaltered lands with some use and facilities; divided into two subzones:</p> <p>Wilderness Subzone and Natural Environment Subzone</p> <p><u>Historic Zone</u>-overlaps the prior subzones contains sites listed or pending nomination to the National Register.</p> <p><u>Development Zone</u>-main visitor use and developed areas including State Route 85. Twin Peaks, and Lukeville.</p> <p><u>Special Use Zone</u>-privately owned lands with uses not normally found in Natural Zone; divided into three subzones: Private Development Subzone, State Lands Subzone, and U.S. Customs and Immigration Reserve Subzone</p>	<p>Apply a new system derived from legislation, purpose and significance, and visitor experience.</p> <p><u>Wilderness Zone</u> – preserves wilderness values identified in the Wilderness Act with two subzones:</p> <p>-Potential Wilderness; and</p> <p>-Quitobaquito Management Area: includes about 2400 acres and visitor use restrictions.</p> <p><u>Non-wilderness zone</u> – provides for uses involving large concentrations of people or facilities; divided into three subzones:</p> <p>-Travel Corridor (includes roads except State Route 85)</p> <p>-Development Area</p> <p>-State Route 85 Corridor: a distinct management emphasis to ensure continued commerce and enhance conservation.</p> <p><u>Cultural Resources Zones</u> – preserves, protect, and interprets cultural resources and settings.</p>
Natural and Cultural Resources Management and Associated Facilities		
Natural and Cultural Resources Management Plan	The NCRMP continues to guide the resources The NCRMP continues to guide the resources management program. Certain actions proposed in	Same as Existing Conditions Alternative except the proposed Wilderness Management Plan would be expanded to address wilderness and backcountry

TOPICS	Alternative A: EXISTING CONDITIONS/ NO ACTION ALTERNATIVE	Alternative B: NEW PROPOSED ACTION ALTERNATIVE
(NCRMP)	<p>the plan help resolve issues identified during scoping of this GMP including the need for: a comprehensive resources management program, mitigation strategies and species recovery plans, and increased efforts to preserve air, water, cultural, and other resources.</p> <p><i>Specific completed or ongoing projects:</i></p> <ul style="list-style-type: none"> ▪ <i>Wildlife Surveys and Ecological Monitoring in Wilderness areas</i> ▪ <i>Threatened and Endangered Species Research and monitoring</i> ▪ <i>Backfilling abandoned mines</i> ▪ <i>Buffelgrass control</i> ▪ <i>Trespass Livestock Mgmt</i> ▪ <i>Revegetation of disturbed sites</i> ▪ <i>North boundary fence- bottom wire replacement</i> ▪ <i>Rebuild/rehabilitate Dos Lomitas</i> ▪ <i>Victoria Mine rehab work</i> 	<p>issues in a regional context. This inter-agency effort may include the NPS, U.S. Fish and Wildlife Service, Bureau of Land Management, and possibly other land managers in the area.</p>
Resources Management Facilities	<p>The former residential building used as office and workspace for resources management would remain. Some new structures may be added in the future to offset the need for more workspace.</p>	<p>A 5,000 s.f. Science, Education and Resource Management Center is proposed. However, in this alternative, it would be located in Twin Peaks by converting the existing visitor/administration facility, and a greenhouse and plant nursery would be constructed nearby for visitor education and research purposes.</p> <p>The existing resources management offices would be converted back to employee homes.</p>
Cultural Resources	<p>Continue stabilization, survey efforts, and the listing of historic properties in the National Register of Historic Places. New developments would be surveyed for archeological resources prior to construction and potential impacts mitigated.</p>	<p>Same as Existing Conditions Alternative. In addition, apply preservation and use treatments for the properties listed and eligible for listing in the National Register of Historic Places.</p>
Native American Consultation	<p>Develop a mutually-beneficial written agreement between the NPS and Tohono O'odham Nation to strengthen consultation, coordination, and involvement. (Note: the need and importance of this agreement was expressed in the Tohono O'odham Nation's comments to the NPS and subsequently, has been added to this and all of the alternatives.)</p>	<p>Same as Existing Conditions Alternative with one addition.</p> <p>The agreement would be expanded to include enhanced involvement of the Tohono O'odham Nation in the monument's interpretation program. The nature and extent of this involvement would be determined by both parties.</p>
Visual Resources	<p>No additional actions are proposed to enhance resource preservation.</p>	<p>Two actions are proposed to help preserve the visual resources of the Sonoran Desert landscape: relocating and placing powerlines underground at their next scheduled replacement and implementing sustainable design guidelines and practices prior to the design of new facilities.</p> <p>The supplement reinforced these actions with the following:</p> <p>The NPS proposes to work with Arizona Public Service to seek ways to off-set costs of relocating and burying lines, and</p> <p>One guideline has been added to help ensure preservation of regional design and maintenance practices.</p>
Interpretation Objectives and Themes	<p style="text-align: center;">Visitor Use and Associated Facilities</p> <p>Implement objectives and themes identified in 1993 Interpretive Prospectus. The <i>objectives</i> address comprehensiveness of the interpretive program, environmental awareness, outreach and regional cooperation, biosphere goals, and the adequacy of information and facilities for visitor use, and safety.</p>	<p>Same as Existing Conditions Alternative.</p>

TOPICS	Alternative A: EXISTING CONDITIONS/ NO ACTION ALTERNATIVE	Alternative B: NEW PROPOSED ACTION ALTERNATIVE
	The <i>themes</i> address: the amazing richness and diversity of the land and the people from past to present, environmental factors and the delicate balance of Sonoran Desert ecosystems, and the monument as a unique living laboratory.	
Interpretative Facilities	<p>Retain existing visitor center. Upgrade the existing amphitheater area since it is in poor condition.</p> <p><i>Specific completed or ongoing projects</i></p> <ul style="list-style-type: none"> ▪ <i>Interpretive wayside, Estes Canyon/Bull Pasture</i> ▪ <i>Vegetation removal for preserving historical structures</i> ▪ <i>Installed Travelers' Information System Station</i> ▪ <i>Parking areas-amphitheater & Victoria Mine</i> ▪ <i>Reconstruct Amphitheater</i> ▪ <i>Interpretive programs at Bates Well and Bonita Well</i> 	<p>The following facilities are proposed to help satisfy the growing need for visitor services in the region and, achieve the objectives and themes within the monument:</p> <p>Support ISDA's center in Lukeville</p> <p>Develop partnerships to establish a regional information and orientation center in Why</p> <p>Convert part of the existing Twin Peaks visitor center and administrative building into an interpretive center with resources management as the major interpretive focus. (To accomplish this, 3,600 s.f. of new space would be added to the existing 5,900 s.f. structure; of the total, 4,500 s.f. would be devoted to the interpretive center and the remainder to the SERMC).</p> <p>Four pull-outs would be added along State Route 85.</p>
Partnerships and Outreach	Increase partnerships with others and expand regional outreach efforts in response to Biosphere Reserve designation.	The potential for partnerships with ISDA, other federal agencies, State of Arizona, and Tohono O'odham Nation increases in this alternative because of the nature of some of the proposed facilities, programs, and agreements.
Camping	Retain existing facilities in Twin Peaks and Alamo Canyon Wash campgrounds.	<p>Increase opportunities for primitive camping by providing:</p> <p>20 new walk-in campsites up-canyon from the existing group campground in Twin Peaks area; the existing parking area would be expanded to provide parking for 20 vehicles and one restroom.</p> <p>Four new drive-in campsites at Alamo Canyon Wash; a day-use only parking area for 6 vehicles would be delineated on previously disturbed land.</p>
Area Transportation Network: Roads	<p>Retain existing road network. As described in the NCRMP, establish user capacities of roads providing access into the wilderness.</p> <p><i>Specific completed or continuing projects:</i></p> <ul style="list-style-type: none"> ▪ <i>Rehabilitate Ajo Mtn Loop Drive</i> ▪ <i>Use of Armenta Road for Patrol and Management Purposes</i> ▪ <i>Pruning and/or removal of trees on all public drives.</i> ▪ <i>Remove vegetation from road shoulders for all paved roadways</i> ▪ <i>Maintenance of graded roads</i> ▪ <i>Borrow pit use</i> ▪ <i>Installation of new road signs</i> ▪ <i>Interpretive waysides, Scenic Drive Entrances</i> ▪ <i>Jersey barrier wall on Pozo Nuevo Road in Cipriano Pass</i> ▪ <i>Trenching and widening of South Puerto Blanco Drive</i> ▪ <i>Installation of gates on South Puerto Blanco Drive and elsewhere</i> 	<p>Same as Existing Conditions Alternative except that some roads in the Twin Peaks and Quitobaquito areas would be re-aligned.</p> <p>For Twin peaks, approximately 800 ft. of new road would be constructed; a 800 ft. length of existing two-lane road would be removed and the area restored; visitors and employees would each have separate access and parking areas; and a turn-around with about 400 ft. of new road would be added at the entrance to Puerto Blanco Drive. The road at Quitobaquito would be removed and restored to natural conditions.</p>
Area Transportation Network: State Route 85	<p>Work with the State and other agencies to minimize road-related impacts on monument resources.</p> <p><i>Specific completed or ongoing projects:</i></p> <ul style="list-style-type: none"> ▪ <i>Installation of new road signs</i> 	Same as Existing Conditions Alternative, except in this alternative, a program is proposed to minimize road-related impacts while ensuring continued commerce and enhancing visitor experience. The program would include establishing pull-outs with interpretive

TOPICS	Alternative A: EXISTING CONDITIONS/ NO ACTION ALTERNATIVE	Alternative B: NEW PROPOSED ACTION ALTERNATIVE
	<ul style="list-style-type: none"> Revise North boundary entrance portal Highway 85 road shoulder maintenance Highway 85 speed limit raised to 65mph <p><i>Note: some of the aforementioned actions are not in keeping with the approved GMP.</i></p>	<p>information, implementing a public education program, and experimenting with mitigation, such as the use of bridges over major washes and culverts in other areas to encourage safe wildlife movement.</p>
Area Transportation Network: Trails and Hiking Routes	<p>Retain the existing hiking system with the following improvements:</p> <ul style="list-style-type: none"> *signs and exhibits would be posted at four trails and hiking routes *the Visitor Center Nature Trail would be doubled in length to .2 miles and made accessible to wheelchairs. <p><i>Specific completed or ongoing projects:</i></p> <ul style="list-style-type: none"> Interpretive trail Quitobaquito Trail maintenance; vegetation trimming Alamo Canyon trailhead parking Bull Pasture/Estes Canyon trail work Interpretive Waysides, Arch Canyon and Estes Canyon/Bull Pasture trailhead Trail head parking, Old Sonoyta Road New route/trail segment: Red Tanks Tinaja to Milton Mine Installed new trailhead signs Established Baker Mine-Milton Mine trail 	<p>Eleven new maintained trails, totaling approximately 30 miles, are proposed to provide visitors access to resources and an understanding of the park's interpretive themes. Signs and route descriptions would be improved for the existing unmaintained trails.</p> <p>In the supplement, trail additions were reduced to 8 new trails (8.9 miles) while the miles of accessible trails increases to 5.5. miles. These changes occur because:</p> <p>One trail proposed in the Former Preferred Future is near prime Rosy Boa habitat and consequently was not proposed here</p> <p>The Quitobaquito trail alignment reduces the total trail miles and increases accessible trail miles.</p>
Park Operations and Associated Facilities		
Staffing	<p>Approximately 27.3 employees are required to fully carry out the monument's purpose, programs, and legislative mandates. The monument would continue to use volunteers from the active VIP program to help offset expanding staff and program needs.</p>	<p>Since prior estimates may be unrealistic in light of current fiscal conditions, only 15 additional employees are proposed in this alternative. This number is based on the rate of past staffing increases averaging one employee per year instead of on projected total needs. In addition, the NPS would seek alternative funding or partnership arrangements to offset staffing costs. Use of volunteers would continue as in the Existing Conditions alternative.</p>
Operations Facilities	<p>Retain existing administrative and maintenance facilities. Add new 3,000 s.f. ranger operations and fire station to help protect lives and property, and offset the current shortage of office, work, and storage space.</p> <p><i>Specific completed or ongoing projects:</i></p> <ul style="list-style-type: none"> Visitor's Center access and parking area modifications Renovate residences to offices Construction of a compressor shed at maintenance shop Construction of new fire station Replacement of gas tanks in maintenance area Herbicide use to control vegetation at sewage lagoon Integrated Pest Management in the VC and other park buildings Telecommunications system improvements Maintenance shop extension Brush pile burning Install modular building at VIP campground Maintenance shop sewer system replacement Bates Well shed removal Fiber optic cable, residence area Chlorination lines to main water tank Installed self-serve fee stations 	<p>The following is proposed to satisfy office, work, and storage space needs in a cost effective manner:</p> <p>Seek partnership for 2,000 s.f. of administrative office space in under-utilized federal facilities at Customs and Immigration Reserve in Lukeville area</p> <p>Expand maintenance area to include 2,000 s.f. office space, 9,100 s.f. covered parking, and 3,050 s.f. storage space, with the addition of a new 4,000 s.f. ranger operations and fire station with nearby helicopter pad.</p>

TOPICS	Alternative A: EXISTING CONDITIONS/ NO ACTION ALTERNATIVE	Alternative B: NEW PROPOSED ACTION ALTERNATIVE
Employee Housing	<ul style="list-style-type: none"> Construction of restroom at Bonita Well <p>The nine houses still used as employee homes would remain in the Twin Peaks housing loop.</p> <p><i>Specific completed or ongoing projects:</i></p> <ul style="list-style-type: none"> Campground for Volunteers-In-Parks Integrated Pest Management in the VC and other park buildings Snake relocation from residence and campground area Rodent exclusion/removal from buildings Finish two duplexes and landscape Residence area revegetation work 	<p>Five buildings would be converted back to employee homes in the Twin Peaks housing area. The NPS would seek partnerships to provide the following in the Lukeville area:</p> <ul style="list-style-type: none"> Apartments for seasonal employees and researchers A small community center for area and monument residents.
Twin Peaks	<p>Development Concept Plans</p> <p>The Twin Peaks area would stay essentially as it looks today. Since additional office space may be added to offset the space shortage, future plans may be developed to site facilities as they are needed.</p> <p><i>Specific completed or ongoing projects:</i></p> <ul style="list-style-type: none"> Install new 6" mainline water valves in select areas of the housing loop Rehabilitate visitor Center & campground comfort stations painting project Replacement of house roofs and additions of new ramadas and yard fences, residence area Install new sewer distribution box behind Visitor's Center Replace old fire hydrants & install new ones Bury electric cable and other electrical work in campground area. Remodel visitor center restrooms (97-01) (including leach field) Convert campsites from RV/pullthru to tent sites Residence 15 parking spaces Replace campground waterline Renovate residences to offices 	<p>Several new developments are proposed in this development to serve expanding needs of visitor, staff, and the science community. All new structures would be located outside the probable maximum flood zone, although some new road construction would occur in this area.</p> <p>The new visitor center, science and resources management center, and rehabilitated administrative facility would become a central complex and include new picnic and parking areas for visitors. A parking area for employees would be located on the opposite side of the complex. The new ranger operations and fire station would be located a short distance away and would include a new parking lot. Expansion of the maintenance area would occur on disturbed lands in the location of the existing facility. Once the office is removed, the housing area would be used only for that purpose and would include a new community center and utility building.</p> <p>The supplement to the draft added the following:</p> <ul style="list-style-type: none"> The extent of new buildings and road realignment is significantly reduced in this alternative Ranger operations and the fire station would be located next to the maintenance complex, on disturbed lands The NPS would seek to establish the new community center in Lukeville instead of Twin Peaks.
Quitobaquito Management Area	<p>Existing road and parking areas would be retained and improved, and an orientation sign with information dispenser added. Due to safety concerns, the area would be staffed during daylight hours of high visitation periods.</p> <p><i>Specific completed or ongoing projects</i></p> <ul style="list-style-type: none"> Quitobaquito water transport system Quitobaquito Wetlands Conservation Projects 	<p>The goal to improve visitor experience and safety would remain as in the Former Preferred Future Alternative. However, the facilities would be relocated based on discussions with the Tohono O'odham Nation. This development concept is general; due to the sensitive nature of this area, a multi-agency task force would be established to develop a detailed design for this area once funding is secured.</p> <p>The new trailhead would be developed at the confluence of Puerto Blanco Drive and the former entrance road. An easy, 1-mile round-trip walking trail network would be established, occurring along the existing entrance road. To help protect resources, visitors would need a permit or to take part in a guided tour to use this area. Administrative access to the border would be provided.</p>
Lukeville Area	<p>Due to recent land exchanges between the NPS and private landowners in the area, the 1978 DCP (Development Concept Plan) is obsolete and would</p>	<p>The 1978 DCP would be replaced with the following: The NPS would seek to enhance linkages between Lukeville and the monument's resources and values.</p>

TOPICS	Alternative A: EXISTING CONDITIONS/ NO ACTION ALTERNATIVE	Alternative B: NEW PROPOSED ACTION ALTERNATIVE
	<p>need to be amended in the future.</p> <p><i>Specific completed or ongoing projects</i></p> <ul style="list-style-type: none"> ▪ Lukeville land exchange 	<p>The NPS would support ISDA's efforts and seek partnerships to:</p> <p>Provide housing, but only for NPS seasonal workers</p> <p>Develop a community center for all area residents</p> <p>Share office space at the border station, except for NPS administration.</p>
Name, Boundary, and Wilderness Area Changes		
Redesignation	The name would remain Organ Pipe Cactus National Monument.	Support change in status from monument to Sonoran Desert National Park, which would require congressional legislation. Redesignation would help draw attention to the value and significance of the monument's varied resources and the need to preserve them.
Boundary Adjustments	No adjustments to the boundary are proposed.	As in the Existing Conditions Alternative, no boundary adjustments are proposed since the Tohono O'odham Nation is not interested in a land exchange at this time. However, the NPS feels the land exchange with the Gu Vo District and the Tohono O'odham Nation along the crest of the Ajo Mountains (Tohono O'odham would receive 1502.6 acres from the NPS along the eastern portion of the divide. The NPS would receive 825.5 acres along the western portion of the divide and 677.1 acres from the western part of the Gunsight Hills) would improve its ability to manage the monument. In the future, if the Tohono O'odham Nation expresses an interest in this idea, the NPS would be willing to enter into discussions.
Wilderness Area Additions	Seek to acquire approximately 1,280 acres currently held by the State and designated "potential wilderness," then propose for wilderness designation.	<p>After actions proposed in this alternative would be implemented, approximately 1,509 acres would be proposed for wilderness designation including:</p> <ul style="list-style-type: none"> ▪ 1,280 acres of State held lands ▪ 206 acres along the powerline corridor ▪ 23 acres along the former road in the Quitobaquito area
Plan Implementation and Costs		
Implementation Strategy	Implementation of development, programs, and staffing additions depends primarily on funding. The highest priority for development is construction of the ranger operations and fire station. Implementation of resource management projects and programs remain as described in the NCRMP.	Projects and programs in this alternative are prioritized and the highest priority projects and programs are the same. However, in this alternative, the fire station and maintenance facility would be located in the Twin Peaks area.
Development Costs	<ul style="list-style-type: none"> ▪ General/park-wide: \$ 314,400 ▪ Twin Peaks Area: \$3,260,000 ▪ Quitobaquito Mgt. Area: 127,000 	<ul style="list-style-type: none"> ▪ Twin Peaks Area: \$5,162,000 ▪ Quitobaquito Mgt. Area: 260,000 ▪ Alamo Canyon Wash: \$ 57,000 ▪ Other (roads, pull-outs ▪ trails, and exhibits): \$1,299,000 <p>Costs involving partners are not included and in this alternative include: ISDA's facility in Lukeville, the regional facility in Why, sharing facilities in the border station for NPS administrative offices, and apartment type housing for NPS seasonal workers in Lukeville.</p>



NEW PROPOSED ACTION ALTERNATIVE

SONORAN DESERT NATIONAL PARK
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DSC/March 1996

Publ. as 157/20014
Now 157/20014A

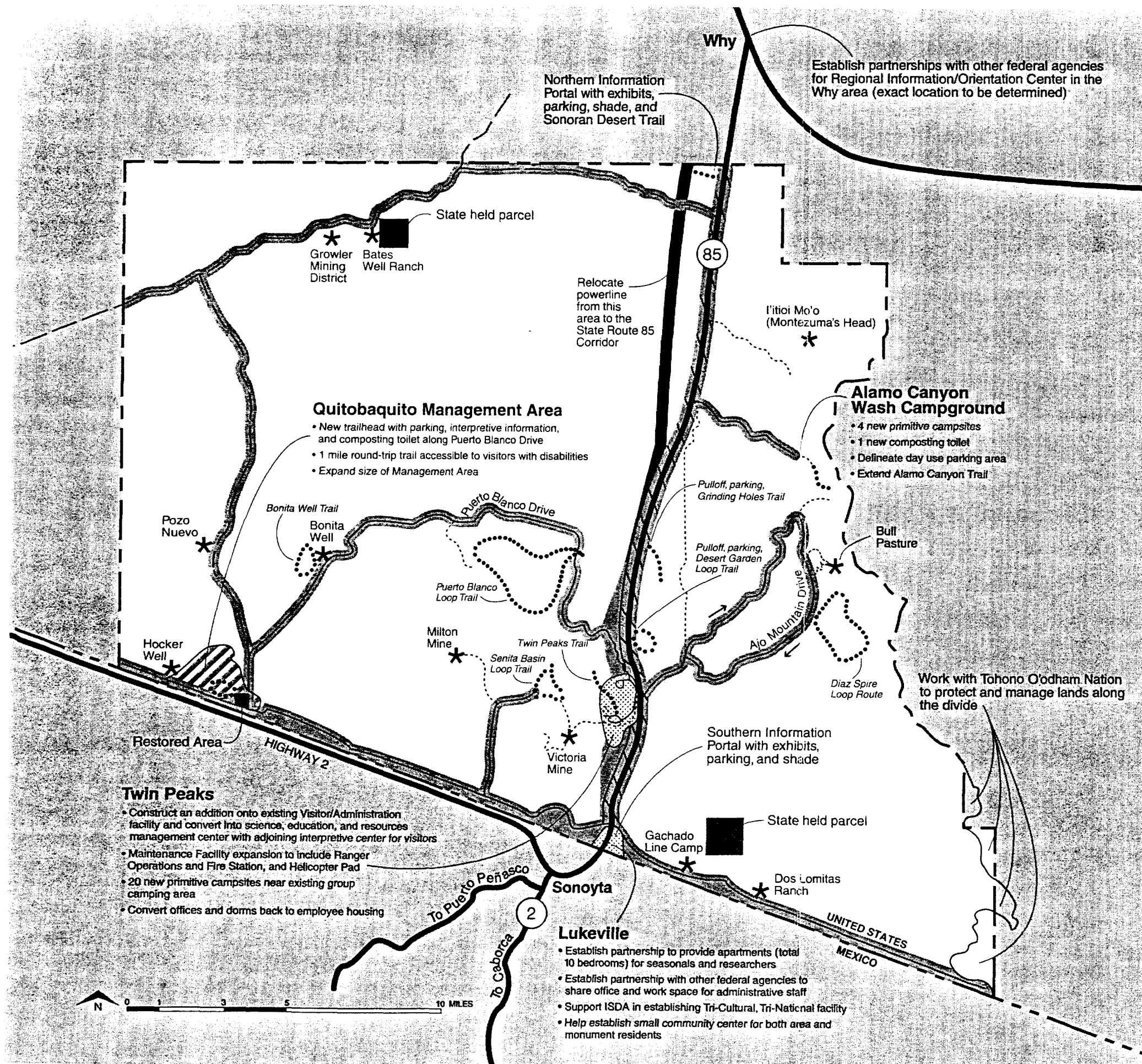
MANAGEMENT ZONES

- Non-Wilderness Development Area
- State Route 85 Corridor Zone
- Non-Wilderness Travel Corridor
- Wilderness Zone
- Potential Wilderness Additions
- Wilderness Zone - Quitobaquito Management Area
- Cultural Resources Overlay Zone

GENERAL LEGEND

- Existing Trails
- Proposed Maintained Trails
- Paved Roads
- Graded Dirt Road
- Unimproved Dirt Road

ON MICROFILM





NEW PROPOSED ACTION ALTERNATIVE

TWIN PEAKS DEVELOPMENT CONCEPT PLAN

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DSC/March 1996

Publ. as 157/20016

Now 157/20016A

- EXISTING BUILDINGS AND FACILITIES
- NEW BUILDINGS AND STRUCTURES
- NEW ROADS, PAVED AREAS, AND OTHER FACILITIES
- REMOVE ROADS: RESTORE TO NATURAL CONDITIONS
- EXISTING TRAIL



Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that "[t]he environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. Preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
5. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Generally this means the alternative that causes the least damage to the biological and physical environment. It also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources" Council on Environmental Quality, "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations" (40 CFR 1500-1508), Federal Register Vol.46, No. 55, 18-26-18038, March 23, 1981: Question 6a).

The No-Action alternative represents the current management direction for Organ Pipe Cactus National Monument. Although this supplement describes no-action alternative at the time the *GMP/DCP/EIS* was approved plus actions that have occurred or are on-going as a result of the plan, the current management scenario has yet to meet all of the goals and objectives in the approved *GMP/DCP/EIS*. Many of the existing facilities still remain and are not easily accessible and often crowded. The speed and volume of traffic on Highway 85 continue to result in noise, air and light pollution, and negatively impact wildlife and the visitor experience. Also, efforts to establish cooperative efforts and partnerships beyond park boundaries have not been fully achieved. As described in the plan, an ecological monitoring program has been expanded and provides the monument resource staff with information to better manage natural resources. An inordinate amount of staff time, however, must be concentrated on reducing impacts resulting from illegal drug and immigrant traffic and, as a result, other monument programs and projects tend to fall short. The No-Action alternative meets policy goals 1 and 4.

The New Proposed Action alternative is the environmentally preferred alternative. The overall effect of this alternative would be to enhance protection, understanding, and recognition of Sonoran desert ecosystems and further strengthen relations with the Tohono O'odham Nation, Mexico, and other neighbors of the monument. Some of the actions to reach these goals include promoting the Man in the Biosphere Program by adopting a regional perspective to improve visitor services and conserve resources, increasing the amount of wilderness and providing for protection of wilderness and wilderness values through a wilderness management plan, and stabilizing and applying preservation and use treatments for historic properties. Other actions to enhance the visitor experience and understanding of the Sonoran desert include providing visitors with updated facilities and traffic circulation, expanding the amount of interpretive trails, and expanding current interpretive programs. Actions to protect endangered species focus on monitoring the effects of visitation on the lesser long-nosed bat and the ferruginous pygmy owl, and working with other agencies to conceive, develop and implement actions to reduce the effect of current and future traffic patterns from State Route 85. These actions would move the park away from existing conditions to a state of conditions that offer more to protect, preserve, and enhance historic, cultural, and natural resources, as well as effectively managing an expected increase in park visitation over the next 10-15 years.

Although the no action alternative may achieve a greater level of environmental protection in isolated areas of the monument in the short-term (no new development, no reconfiguration of roads and trails), the preferred alternative overall more fully strives to (1) Attain the widest range of beneficial uses of the environment without degradations, risk to health or safety, or other undesirable and unintended consequences; (2) Preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice; and (3) Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.

This supplement meets the project objectives described in *Purpose and Need* of this document by addressing the order set forth in the 12 February 2001, United States District Court of the District of Columbia (Civil Action No. 99-927). The NPS reviewed all monument activities (both ongoing and proposed in the *GMP/DCP/EIS*), ranked those actions in terms of the context, duration, and intensity of impact they may have on the Sonoran pronghorn and its habitat (see *Cumulative Impacts – Methodology for Assessing Cumulative Impacts*), and added those activities to other past, present, and reasonably foreseeable future actions, regardless of what agency undertakes those actions.

AFFECTED ENVIRONMENT

Sonoran Pronghorn Habitat and Range

The Sonoran pronghorn inhabits broad alluvial desert valleys, bajadas, and to a lesser extent foothills areas in southwestern Arizona and northwestern Sonora (Hoffmeister 1986, USFWS 1998). Like other subspecies of the American pronghorn, they prefer open country with expansive views (USFWS 1998). Flat valleys and isolated hills are used more than other topographic features such as mountain slopes (AGFD 1985). The Sonoran pronghorn is found in the Lower Colorado River Valley and Arizona Uplands subdivisions of Sonoran Desertscrub (Brown 1982). The Sonoran pronghorn tends to inhabit relatively open expressions of these associations. However, seasonal shifts in habitat use are now known. In general, Sonoran pronghorn tend to occupy valley floor areas in winter (Lower Colorado River Valley subdivision), then move upslope (and southeastward) onto bajadas in spring and summer, into Arizona Uplands subdivision habitats (Wright and deVos 1986, Hervert et al. 1996). The valley floors used in winter tend to be open habitats of creosote-bursage associations with some perennial grasses, and some winter annual plants providing additional forage. Trees such as paloverde (*Cercidium* and *Parkinsonia* spp.), ironwood (*Olneya tesota*) and mesquite (*Prosopis* sp.) are present primarily along dry watercourses, and are used for thermal cover. As the annual spring dry season progresses, pronghorn move eastward and upslope into the comparatively more dense and diverse Arizona Uplands association. It is likely that by making this seasonal movement, pronghorn may be able to access more forage plants that have substantial water content, and also escape a few degrees of heat by gaining altitude and greater access to thermal cover.

The Sonoran pronghorn range is functionally divided into two, possibly three subpopulations, by a combination of busy roadways and fences. The United States population is separated from the Mexico population by Mexico Highway 2 and the International Boundary fence (Figure 4). The Mexican population is likely to be further subdivided, by Highway 8, which connects the border city of Sonoyta, Sonora, with the coastal city of Puerto Penasco, Sonora. Available literature indicates that as Highway 8 has become improved and much busier in the 1990s, and being fenced for part of its length, it is now likely to prevent movement between pronghorn in the Pinacate region and those on the coastal plain east and south of Highway 8 and Puerto Penasco (Ockenfels et al. 1994, Ockenfels et al. 1997, USFWS 1998, Bright and van Riper III 2000, J. Hervert, AGFD, and C. Castillo, El Pinacate Biosphere Reserve, pers. comm.).

The pronghorn's current range in the United States is the area bounded on the north by Interstate 8, on the east by Highway 85, on the south by the International Boundary/Highway 2, and on the west approximately by the Tule Desert west of the Cabeza Prieta Mountains (Figure 3). In the United States, Sonoran pronghorn apparently no longer (or rarely) occur east of Highway 85. The last pronghorn known to occur east of Highway 85 in the Monument was a male found dead near the Ajo Mountain Loop Drive in 1972. The only indication of pronghorn crossing Highway 85 since then was a June 1996 sighting of a single female crossing east to west, approximately 12 miles north of Ajo on the Barry M. Goldwater Range (USFWS 1998). During 7 years of continuous radiotelemetry monitoring of a subset of the U.S. population, no radioed pronghorn have been detected east of Highway 85 (Arizona Game and Fish Department unpubl. data). Although observations along State Route 85 have been limited in past decades, pronghorn were supposedly not uncommon along the highway and throughout the Sonoyta Valley as recently as the 1960s (H. Coss, NPS Retired, pers. comm.). Long-time Ajo residents reported seeing more Sonoran pronghorn along the highway near Ajo and south in the Valley of the Ajo in previous decades (USFWS 1998). A recent remote-sensing habitat analysis indicated that suitable pronghorn habitat does exist east of Highway 85 in Organ Pipe Cactus (Marsh et al. 1999). Organ Pipe Cactus National Monument is within the current and historic range of the Sonoran pronghorn. Pronghorn are present in the Monument year-round, but there is likely an increase in numbers in summer, when pronghorn from areas to the north and west move into Organ Pipe. Thus the monument serves as crucial habitat for pronghorn to survive the midsummer stresses of extreme heat and aridity. For example, in the summers of 1996 and 1997, up to 70% of the radiocollared subset of the population was

in the monument (AGFD unpubl. data). While historically pronghorn probably ranged throughout suitable habitat west of the Ajo Mountains, in contemporary times they are found only west of Highway 85 in the Monument. All valley floors, bajadas, smaller hills, and foothills areas west of Highway 85 are potentially occupied by pronghorn. Based on radiotelemetry data and incidental visual sightings, pronghorn most commonly occur in the Valley of the Ajo, the Puerto Blanco Mountains' foothills, Acuna Valley, Bates Mountains' foothills, Growler Valley and San Cristobal Wash.

Environmental and Human-Induced Factors Affecting Sonoran Pronghorn

The USFWS uses threat factors to determine whether a species should be listed, and the definition of "take," as presented in the Endangered Species Act of 1973 and its implementing regulations. The combination of those terms serves as a valuable categorization of the factors that may affect Sonoran pronghorn.

Loss or Modification of Habitat

Loss or modification of habitat is a potential impact on Sonoran pronghorn. Loss or modification of habitat can reduce the ability of the overall U.S. population to cope with limitations of forage by moving from place to place. Ultimately, loss or modification of habitat would reduce the carrying capacity of the U.S. range, resulting in a lower population. Examples of actions that may result in loss or modification of habitat include: permanent human developments; building roads, trails, or other areas cleared of vegetation; invasion by non-native plants; modification of plant communities due to livestock grazing, burning, etc.

Curtailment of Habitat or Range

The curtailment of habitat and range are also in effect large-scale losses of Sonoran pronghorn habitat. Sonoran pronghorn are nomadic animals. They survive the demanding conditions of the desert by roaming widely, exploiting wide-spread and often ephemeral resources of food, water and shelter (Hoffmeister 1986, Hervert et al. 1996). An individual Sonoran pronghorn may move many tens of miles in several days, simply following or seeking favorable conditions that result from localized rains and green areas. Curtailment of Sonoran pronghorns range equates to restriction of their nomadic movements, and probably significantly reduce their ability to survive. For example, Sonoran pronghorn tend to move east and upslope as the hot, dry weather of April-July develops. The animals appear to be making this movement to access more heavily vegetated desert scrub, where they find a wide variety of forage that allows them to survive through the annual spring drought (Hervert et al. 1996). Pronghorn, particularly Sonoran pronghorn, do not easily cross busy paved roadways (Ockenfels et al. 1994, Ockenfels et al. 1997, USFWS 1998, Bright and van Riper III 2000). In general, the wider and busier a road, the more likely it is to be a barrier to movements. State Highway 85 has become a barrier to the easternmost movements of Sonoran pronghorn, as Interstate 8 and Mexico Highway 2 are barriers to movements to the north and south, respectively. By denying Sonoran pronghorn seasonal access to these habitats, the survival options for the herd may be reduced. Fences are also barriers to movement, and probably confound movements within the area enclosed by these major roadways. Pronghorn generally prefer to go underneath fences, rather than leap or climb over them. Pronghorn are reluctant to go underneath the standard livestock fence, which has a barbed bottom wire, often fairly close (e.g. 10" or 12") above the ground.

To put place the curtailment of range and movements into perspective, the historical range of Sonoran pronghorn in the United States once included almost the entire southwestern quarter of Arizona, and extreme southeastern California, an area of roughly 8 million acres. Currently, movement barriers confine Sonoran pronghorn to an area of approximately 2.5 million acres. Organ Pipe Cactus NM provides approximately 200,000 acres of pronghorn habitat.

Disturbance

Disturbance is one of the more common and severe forms of stress on the Sonoran pronghorn. Sonoran pronghorn are quite "skittish" and shy of humans. Pronghorn in proximity to humans, on foot or in vehicles, will move away (USFWS, 1998; Krausman, et al., 2001). This effect can have several impacts: human presence causes Sonoran pronghorn to move from an area, thereby denying pronghorn access to

that specific site for what are probably crucial ecological functions (e.g. foraging, bedding, seeking thermal shelter, seeking mates, seeking fawning sites, seeking areas of relative safety from predators). Causing Sonoran pronghorn to move also increases physiological demands by expending calories and metabolic water. These may be critical stresses in normal seasonal hot-dry periods, and in extended periods of low forage availability. Disturbance may also lead indirectly to mortality; causing an animal to be alarmed, agitated, and fleeing a disturbance source may make it vulnerable to predator attack. Causes of disturbance of Sonoran pronghorn are likely to include: recreation; on-the-ground management activities; vehicles; aircraft; and movements of large numbers of illegal immigrants and smugglers.

Direct Mortality

Direct killing of Sonoran pronghorn from human/agency actions is possible, although rare. Roadkill is possible on Highway 85; the USFWS Biological Opinion contained in the GMP/DCP/EIS allows "take" of one Sonoran pronghorn in this fashion. As vehicular traffic on all roads increases, the possibility of roadkill also increases. It is not inconceivable that roadkill could happen on the park's unpaved roads. It is also possible that direct mortality could occur in the form of poaching. Poaching is known to have occurred in the U.S. and Mexico through the 1900s (USFWS 1939b, 1940, 1946a, 1946b, 1951, 1954a, 1966, 1971), and is suspected to have persisted into recent years (USFWS 1998).

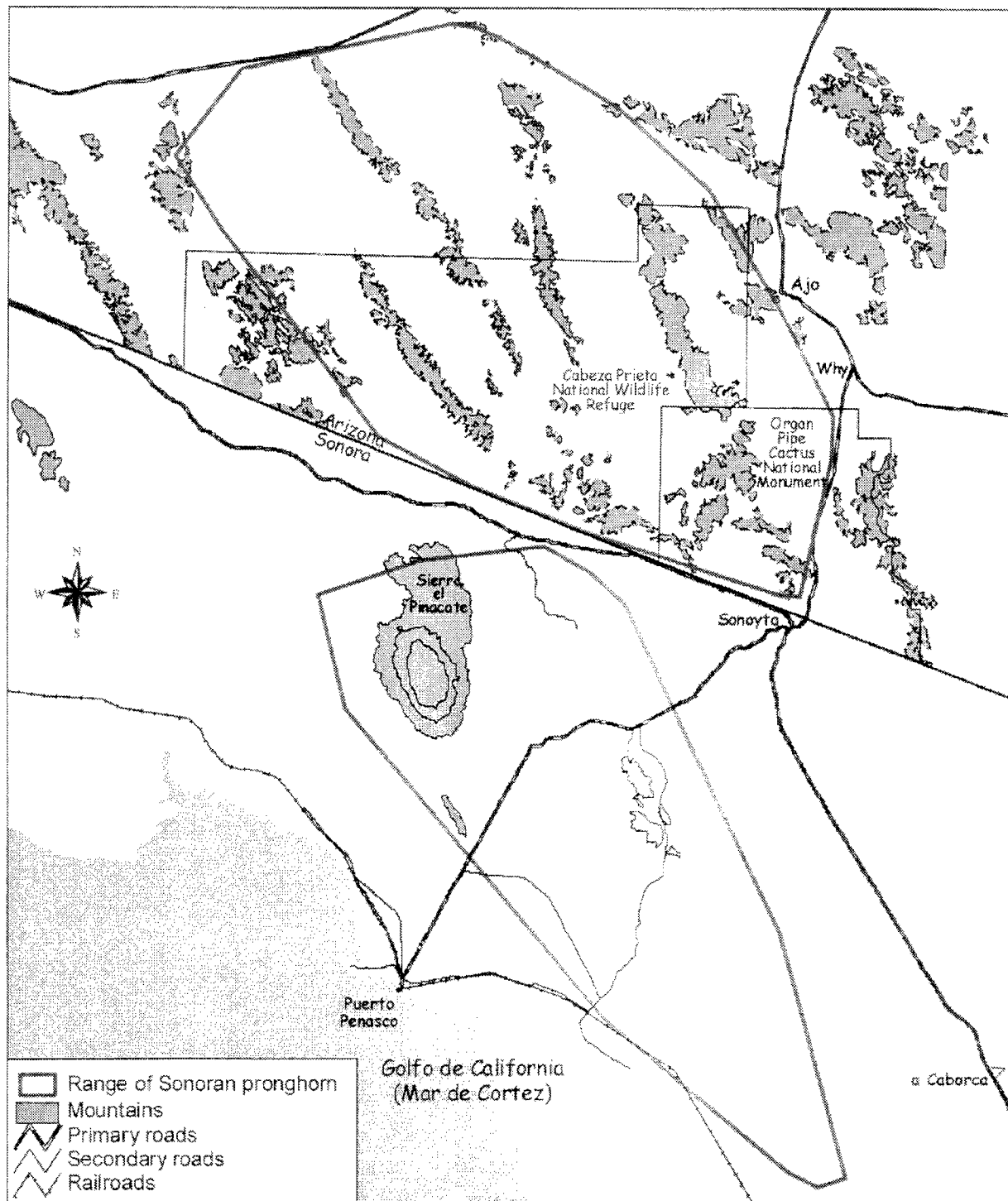
Disease and Predation

Sonoran pronghorn are susceptible to natural disease and predation. Potential diseases include epizootic hemorrhagic disease and bluetongue and Foot-and-Mouth disease (USFWS 1998). Predation by coyotes, bobcats, and mountain lions is likely to take place.

Other Natural or Manmade Factors that Affect Pronghorns' Continued Existence

Sonoran pronghorn may be impacted by other factors that are either natural or caused by humans. These may include extreme physiological stresses of drought and heat, competition for food from domestic livestock, and other factors (USFWS 1998).

Figure 3. Current U.S. Sonoran Pronghorn Distribution



ENVIRONMENTAL CONSEQUENCES

Regulations and Policy

As with all units of the National Park System, management of Organ Pipe Cactus National Monument is guided by the 1916 Organic Act; the General Authorities Act of 1970 and the act of March 27, 1978, relating to the management of the National Park System; *NPS Management Policies, 2001*, and other applicable federal laws and regulations. The conditions prescribed by laws, resolutions, and policies most pertinent to the planning and management of the monuments are summarized below:

Desired Condition: Federal- and State-listed threatened and endangered species and their habitats are sustained.

Source: Endangered Species Act; NPS Management Policies

Desired Condition: Populations of native plant and animal species function in as natural condition as possible except where special management considerations are warranted

Source: NPS Management Policies

Desired Condition: While Congress has given the Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement (enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise.

The impairment that is prohibited by the Organic Act and the General Authorities Act is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts.

Source: NPS Management Policies

CUMULATIVE IMPACTS

Methodology for Assessing Cumulative Impacts

As stated before, the "cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to the impacts of other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions.

Impacts are described in terms of type, duration, and intensity:

Type: Impacts are described as adverse or beneficial. Adverse impacts would result in negative consequences to Sonoran pronghorn, generally in the categories discussed above in Affected Environment. Beneficial impacts would improve or restore habitat or provide a greater chance for pronghorn survival, or in some other way reduce the adverse stresses discussed above in Affected Environment.

Duration: the following terms will be used to measure the duration of an impact

Short-term: impact lasts less than one year

Long-term: impact lasts greater than one year

Intensity: the following terms will be used to measure the intensity of an impact:

- Negligible: an action that could result in a change to a population or individuals of a species or habitat, but the change would be so small that it would not be of any measurable or perceptible consequence.
- Minor: an action that could result in a change to a population or individuals of a species or habitat. The change would be measurable but small and localized and of little consequence.
- Moderate: an action that would result in some change to a population or individuals of a species or designated critical habitat. The change would be measurable and of consequence but would be of moderate scale and would occur over a limited area.
- Major: an action that would result in a significant change to a population or individuals of a species or resource or habitat. The change would be measurable and either result in a major beneficial or major adverse impact upon a population, individuals of a species. The impacts or benefits are very significant and occur over a wide geographic area.

Action Area

The geographical area in which past, present, and foreseeable actions were identified was delineated and agreed upon by agencies affected by the Defenders of Wildlife et al. vs. Babbitt, et al., litigation, at a February 27, 2001 coordination meeting. This area, known as the "action area," was defined with the understanding that certain actions, whether federal or non-federal, may occur outside of the pronghorn's current range and even outside of its reasonably foreseeable range. Nevertheless, these activities could have some direct or indirect effect on the Sonoran pronghorn. The Action area is bounded on the north by Interstate 8; on the east by the eastern boundaries of the Barry M. Goldwater Range, Ajo area BLM lands, and Organ Pipe Cactus National Monument; on the south by the International Boundary; and on the west by the Tinajas Altas mountains. This area includes lands managed and/or used by the Bureau of Land Management, the US Air Force, US Marine Corp., the US Fish and Wildlife Service, and the National Park Service. This area includes all of the current range of the U.S. population of Sonoran pronghorn, plus additional adjacent areas that were historically part of the subspecies' range. Because of its proximity to Mexico, Organ Pipe Cactus National Monument is also considering actions in adjacent Mexico, including the El Pinacate Biosphere Preserve and areas in the Rio Sonoyta valley.

The Cumulative Scenario

The Cumulative Scenario is a list and brief description of all of the past, present, and reasonably foreseeable future actions occurring in the Action Area that agencies, organizations, or persons have, are, or plan on implementing (Appendices C and D). In the cumulative scenario presented in Appendices C-D, each individual action is briefly described, along with how each action may impact Sonoran pronghorn. The impacts of each action are then rated using the terms (type, duration and intensity) described in this methodology. Included in this scenario are past NPS actions as well as NPS actions that are not considered in either of the alternatives presented. Actions are not considered in either of the alternatives presented because 1) they have not been initiated, therefore they do not fall under the updated Existing Conditions/No Action alternative; or 2) they are not described under the New Proposed Action alternative. Cumulative impacts are analyzed by assessing the impact of the actions in the cumulative scenario against the impacts of the alternatives presented in this supplement.

Methodology for Screening and Rating Actions

The NPS has a large number of programmatic and specific actions occurring throughout the park, ranging from ongoing monitoring and maintenance to new construction. In order to determine if all past and current, and reasonably foreseeable future actions may have any type of effect on Sonoran pronghorn, each action was screened for their probable impacts on Sonoran pronghorn using the following methods described below (See also Appendices B, C, and D).

1. The anticipated impact of each project on the Sonoran pronghorn was attributed using previously defined impact intensity classes. Impacts were assessed with respect to pronghorn habitat, behavior, and demographics, i.e., reproductive biology/ecology.
2. The classified list was then sorted and all proposed projects judged to have no impact upon pronghorn were removed from this initial list. Examples of project proposals with no anticipated impacts on pronghorn include proposals involving administrative needs such as upgrading equipment or performing minor maintenance on existing building in a developed area such as replacing roofs, siding or upgrading electrical systems, or actions taking place outside of pronghorn habitat with no foreseeable effects within pronghorn habitat.
3. Both anticipated direct and indirect impacts of each proposal were assessed. For example, providing an artificial water source in pronghorn habitat may have direct beneficial impacts to pronghorn. However, that water source could also be an indirect adverse impact to pronghorn if it were to increase the presence of predators.
4. The remaining proposals, which were judged to have at least a negligible or more severe impact, were then assessed for their anticipated capacities in terms of impact duration, context (local, local scattered; i.e. several separate sites, and regional, i.e., impacts could be manifested anywhere within the monument.)

Impacts on the Sonoran Pronghorn from Alternative A: Existing Conditions/No Action Alternative

Impact Analysis

The impacts of Alternative A, the Existing Conditions/No Action Alternative are summarized and analyzed in Appendix B. Each individual action is briefly described, along with how each action may impact Sonoran pronghorn. The impacts of each action are then rated using the terms (type, duration and intensity) described in the methodology presented above. In addition to the detailed analysis presented in Appendix B following narrative provides an overview discussion of some of the major actions impacting Sonoran pronghorn, grouped under the major impact types discussed above under "Affected Environment."

Loss or Modification of Habitat

Under the Existing Conditions Alternative, the NPS is implementing a number of actions and activities that increase, conserve, or enhance Sonoran pronghorn habitat. Other actions may contribute (or have contributed) to the destruction or modification of habitat of the Sonoran pronghorn. Both types of impacts discussed in this section range from short-term to long-term in duration, from negligible to major in intensity, and from localized to regional in geographic context.

A number of NPS actions may result in short- to long-term beneficial impacts of moderate to major intensity (Appendix B). Actions to remove and/or control Buffelgrass allow natural vegetation processes within the monument to return, thereby providing more forage for pronghorn. Control of trespass livestock into the monument reduces competition for available forage and decreases the potential of disease transfer. Law enforcement efforts to control illicit immigrant and drug traffic decreases the amount of human presence in pronghorn habitat, thereby allowing pronghorn to more fully utilize their range within the monument. Developing long-term scientific information on endangered species and general ecological monitoring may result in increased knowledge about the species and its habitat.

Many NPS actions may have adverse impacts on Sonoran pronghorn. Although not an action undertaken by the NPS, the increase in traffic volume, speed, and the overall footprint of Highway 85 through the monument continues to have major, long-term adverse impacts to pronghorn by acting as a movement barrier. Developing and promoting new hiking trails in the Puerto Blanco and Sonoyta Mountains would likely increase foot traffic in this area and may result in modifications to the pronghorn's historic range. Illegal woodcutting in various areas of the monument directly degrades Sonoran pronghorn habitat. Illicit cross-country driving, the continued administrative use of Armenta Rd., and law enforcement efforts to control illicit immigrant and drug traffic all result in major, long-term, adverse impacts to the Sonoran pronghorn from the destruction of habitat and the restriction/modification of pronghorn movements. A range of other projects have minor to negligible adverse impacts on habitat, generally on localized scales (Appendix B).

Although not discussed under a specific project title in Appendix B, roads are also degrading habitat. Some sections of road are deeply entrenched and are becoming more so. The Bates Well Road near the Pozo Nuevo Road, and the North Boundary Road west of Armenta Ranch are examples of entrenched road sections in prime pronghorn habitat. Entrenched roads have various impacts, including changes to natural surface water flow patterns, gulying and other accelerated erosion features, and destabilization of ancient soil surfaces and topography. Vegetation patterns and productivity can change as a result of these impacts. The physical impacts of roads (versus behavioral impacts discussed below) are adverse, generally long-term, and moderate to major in intensity.

Curtailment of Habitat or Range

A number of actions and activities contribute (or have contributed) to the curtailment of habitat or range of the Sonoran pronghorn. Other actions have beneficial impacts, resulting in reducing curtailment of habitat or range. Both types of impacts range from long-term to short-term in duration, from negligible to major in intensity, and from localized to regional in geographic context.

Moderate to major beneficial impacts include removing the livestock fence along most of the boundary between the monument and Cabeza Prieta NWR; and modifying the monument's north boundary fence (between OPCNM and BLM lands, west of Highway 85). The removal of fencing allows pronghorn to move more freely within their range.

Moderate to major adverse impacts to pronghorn revolve mainly around Highway 85. Road shoulder maintenance (e.g. widening) may increase the movement barrier effect. Also, as traffic volumes and speeds continually increase, Highway 85 becomes a more and more firm barrier to pronghorn movement. The monument constitutes the eastern end of the current range of Sonoran pronghorn (Figure 3). While pronghorn are present in the monument at any time of year, a greater proportion of the U.S. population is present in the Monument from approximately February through August each year. This period corresponds with the annual spring warming-drying trend. Pronghorn move east into the monument and upslope onto more densely vegetated bajadas in search of forage, thermal cover, and a slight respite from the greater heat of valley floors. Thus pronghorn use the monument under conditions when they are at their greatest thermal and hydrational stress. Pronghorn used to cross Highway 85 to use bajada habitats in eastern portions of the monument, but they no longer do. Studies on pronghorn elsewhere indicate this change is likely because of steadily increasing volume and speed of traffic on Highway 85 (Ockenfels et al. 1994, Ockenfels et al. 1997, USFWS 1998, Bright and van Riper III 2000). Currently, Highway 85 bears heavy tourist and commercial traffic, with a posted speed limit of 65 mph.

Some fences remain which may adversely impact pronghorn movements. The monument's south boundary fence is standard livestock fence, and probably inhibits or prevents pronghorn passage. However, greater impacts to movement may likely be the result of Mexican Highway 2, located adjacent and parallel to the fence. The fence between BLM and Tohono O'odham lands east of Highway 85 remains as a standard livestock fence. The eastern boundary of the monument is primarily the high, rugged crestline of the Ajo Mountains. This boundary is fenced only in high saddles where domestic livestock might range; the remainder of that boundary is nearly vertical topography. Sonoran pronghorn are unlikely ever to occur in this steep, rugged area.

Some corridors of human activity may act as transient barriers to movement. The graded dirt roads west of Highway 85 are frequently crossed by pronghorn (AGFD unpubl. telemetry data and NPS staff pers. obs.). However, during transient periods of heavier vehicular traffic (e.g. during exceptional wildflower blooms), human activity on these roads may temporarily inhibit pronghorn movement and limit range. Some centers of human activity are likely to curtail the pronghorn's range. Twin Peaks developed area comprises an area of permanent human activity. This activity is likely to inhibit pronghorn from using adjacent landscapes.

Overall, under the Existing Conditions Alternative, Sonoran pronghorn retain essentially unrestricted freedom of movement throughout the monument west of Highway 85, and between the monument and Cabeza Prieta NWR. However, movements and habitat have been limited by surrounding highways and some remaining fences. Movement between the monument and BLM lands west of Highway 85 has been facilitated by improving the fence design, but may still be inhibited by the existence of even a pronghorn-friendly fence.

Disturbance

A number of actions and activities that either reduce or contribute to disturbance of the Sonoran pronghorn have been previously discussed in other sections (Loss or Modification of Habitat, Curtailment of Habitat or Range). These actions may result in impacts that range from short- to long-term in duration, from negligible to major in intensity, and from localized to regional in geographic context.

Law enforcement control of illicit immigrant and drug traffic has resulted in short- to long-term beneficial impacts of moderate to major intensity. A range of other projects have minor to negligible beneficial impacts by reducing disturbance, generally on localized scales.

Creating and promoting new hiking trails in the Puerto Blanco and Sonoyta Mountains; law enforcement efforts to control illicit immigrant and drug traffic that results in pushing traffic into backcountry habitat

areas; administrative use of Armenta Road; and, emergency operations all contribute to pronghorn disturbance and may have short- to long-term, adverse impacts of moderate to major intensity. A range of other projects have minor to negligible adverse impacts in the form of disturbance, generally on localized scales (Appendix B).

It is also likely that Sonoran pronghorn in the monument are subjected to disturbance events that vary substantially in intensity and are sporadic in time and place. Viewed as a whole, however, these actions may result in a nearly daily exposure to disturbance. For example, the graded roadways in western portions of the monument may have adverse impacts to pronghorn habitat at a minor to moderate level of intensity, but when added with park visitation pressures, illegal immigration, smuggling traffic, and related law enforcement efforts, major and fairly continuous disturbance takes place. Disturbance of this intensity and frequency may result in physiological stress, excessive movements, and avoidance of areas that might otherwise be preferred habitat. Ultimate consequences may include diminished physical fitness, reduced adult survival, reduced fawn survival, and susceptibility to predation. It has long been known that Sonoran pronghorn are wary of people on foot or in motor vehicles (USFWS 1998); Krausman et al. (2001) further substantiated this recently. This is the primary form of potential disturbance, and results from activities of both the visiting public and the monument management.

The progressive development of the Twin Peaks area has impacted several hundred acres from use as potential pronghorn habitat. In addition to that, the human activity associated with the Twin Peaks development area probably inhibits pronghorn from using the adjacent landscapes (Bright and van Riper III, 2000).

Direct Mortality

A number of actions and activities may result in direct mortality of Sonoran pronghorn. Other actions have beneficial impacts, resulting in reducing the potential for mortality.

NPS Law enforcement patrols aid in reducing the occurrence of poaching within the monument. Removing livestock fencing along most of the monument's northern boundary (between the monument, and Cabeza Prieta NWR and BLM lands, west of Highway 85) has helped reduce the potential for death by entanglement. Backfilling abandoned mining features help to prevent wildlife pitfalls. All of these actions result in long-term, beneficial impacts of moderate to major intensity.

The potential for roadkill on Highway 85 due to increasing volume and speed of traffic continues to be a potential adverse impact. Of equal concern but less probability is the potential for roadkill on scenic drives within the monument.

Overall, direct mortality of pronghorn due to human-induced factors seems to be a negligible to minor impact in the monument. No such events have been documented in over 30 years.

Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Few or no impacts under this category can be identified for the Existing Conditions Alternative. There are no permitted commercial or recreational uses of pronghorn taking place in the monument. The monument does issue an annual Scientific Research and Collecting Permit to AGFD, for the purpose of carrying out research and monitoring activities authorized by the USFWS. These activities primarily consist of weekly radiotelemetry flights, and biennial interagency aerial surveys of Sonoran pronghorn. The capture and radio-collaring operations themselves have resulted in deaths of pronghorn in the past. However, captures take place outside the monument, primarily because the Monument presents terrain that is inherently risky to pronghorn for capturing procedures.

Disease, Predation

A number of actions and activities may result in adverse increases in disease and predation of Sonoran pronghorn. Other actions have beneficial impacts, resulting in reducing the potential for these factors.

Disease - The monument's program for excluding domestic livestock is a beneficial impact, reducing the potential for transmittal of diseases such as Foot-and-Mouth disease. Currently, the monument does not

have a horse patrol program and does not maintain livestock, which could be potential disease vectors for Sonoran pronghorn. Recreational use of domestic livestock (horses) is allowable in the backcountry. Although this activity rarely takes place, it could constitute an adverse impact by introducing the possibility of disease transmission.

Predation - It is assumed that normal predation pressure takes place, from coyotes, bobcats, and mountain lions. In recent years, examination of the site of death of at least one radio-collared pronghorn in the monument indicated predation by a bobcat (J. Herver AGFD pers. comm.). The monument does not census, monitor or control predator populations of potential pronghorn predators. It is assumed that predation is occurring at normal natural levels.

Other Natural or Manmade Factors Affecting Continued Existence

Several actions and activities may result in other adverse or beneficial impacts on Sonoran pronghorn. Primarily, the monument's program for excluding domestic livestock is a beneficial impact of major intensity, reducing the potential for competition with Sonoran pronghorn for forage.

Cumulative Impacts

The impacts of all other past, present, and reasonably foreseeable future actions, for the NPS and all other agencies and entities, are discussed and analyzed in Appendix C. Each individual action is briefly described, along with how each action may impact Sonoran pronghorn. The impacts of each action are then characterized using the terms (type, duration and intensity) described in the methodology presented above. The cumulative impacts of all those actions, when added to the impacts of Alternative A (Existing Conditions), are discussed here. The following discussion provides an overview of these cumulative impacts on Sonoran pronghorn, grouped under the major impact types discussed above under "Affected Environment."

Loss or Modification of Habitat

The cumulative impacts of the Existing Conditions Alternative (Appendix B), when considered with all other past, present, and reasonably foreseeable future actions (Appendix C), result in changes in the quantity and quality of habitat for the Sonoran pronghorn. Individual actions result in an entire range of impacts, from major beneficial to major adverse, from short-term to long-term durations, and vary in geographic scope from localized to widespread. Several major impacts are discussed below.

Livestock ranching on the monument, and probably other parts of the Sonoran pronghorn range in the U.S. had adverse and long-term impacts on the subspecies, just as livestock grazing has impacted other pronghorn populations (Bright and van Riper III, 2000). The excessive stocking rate and yearlong use exceeded sustainable use for more than half a century. Short-term overuse by livestock can lead to loss of plant vigor, decrease in plant cover, and decrease in seed input to the system. Longer-term overuse can cause further decreases in plant cover, plant density, and shifts in species richness, composition and diversity. Long-term grazing pressure of the sort that occurred on the monument and adjacent areas can have long-lasting impacts, including type conversions (changing one type of plant association to a less productive type), decrease in species richness, decrease in species and community diversity, and accelerated erosion. All these effects would have strong potential adverse impacts on the availability of forage for pronghorn (See Appendix C). Furthermore, desert plants, particularly long-lived species, and desert plant communities take many decades if not centuries to recover from such extensive disturbance. A major beneficial impact has been that livestock grazing was phased out on the monument, CPNWR and BMGR in the late 1970s. While the benefits of those actions are widespread, ecosystem recovery is only beginning to take place. Pronghorn habitat still bears the impacts of decades of overgrazing, but it is improving. Current actions to continually exclude livestock from the monument, CPNWR, and BMGR will aid in this ecosystem recovery. Livestock grazing persists on approximately 90,000 acres of potential pronghorn habitat on BLM lands west of Highway 85 near Ajo.

The increasing regional trend in human populations has also resulted directly and indirectly in loss and modification of habitat. Increasing human populations have resulted in various types of encroachment and conversion of pronghorn habitat to developed areas. These include towns (e.g. Ajo, Gila Bend, Tacna, Wellton, Hyder, Sentinel, Dateland, Yuma, Sonoyta MX) and agricultural development in the Gila

River and Rio Sonoyta valleys. Large increases in human population in Tucson, Phoenix, and southern California have resulted in dewatering the Gila River, and habitat impacts from increasing recreational use of pronghorn habitat (e.g. creating and maintaining roads, campgrounds, visitor's facilities, etc.). This latter effect also has disturbance impacts (see below).

Historic mining activities, grazing of livestock, and subsistence woodcutting are likely to have resulted in habitat impacts in the form of surface disturbance. Mining activities have been phased out on OPCNM, CPNWR, and BMGR.

Military activities are likely to have resulted in habitat impacts in the form of surface disturbance from ground-based activities and air-to-ground ordnance deliveries. In recent decades, air-to-ground ordnance deliveries have been confined to more restricted areas than during World War II and the decades immediately following.

The activities surrounding undocumented alien (UDA) immigration, smuggling, and related interdiction activities by federal, state and local law enforcement agencies have had adverse cumulative impacts on pronghorn habitat. Movement of UDAs takes place by foot and vehicles, on established roadways and cross-country, across OPCNM, CPNWR, and BMGR. By 2001, estimates of UDA traffic reached 1000 per night in the monument alone, with extensive drug smuggling taking place simultaneously. This traffic and related interdiction activities have resulted in numerous new dirt roads and trails being established through pronghorn habitat. Discarded trash is also ubiquitous, with unknown impacts on wildlife. Smugglers and UDAs also cut firewood and build fires; several escaped campfires have impacted habitat in OPCNM in recent years (OPCNM file reports). The activities surrounding UDA immigration, smuggling, and related interdiction activities also have adverse disturbance impacts.

Locally, cumulative habitat loss has occurred from establishing, maintaining, improving, and expanding facilities used for management of the monument and providing services to the visiting public. The majority of these actions center on the Twin Peaks area (visitor's center, residence area, maintenance area, campground; See Appendices B -C.). Establishing, maintaining, and incrementally developing the Twin Peaks area has removed several hundred acres from potential use as pronghorn habitat. This area is an upper bajada area with moderately dense desertscrub vegetation. This habitat type is used by pronghorn in spring and summer when they are at their peak physiological stress from heat and aridity. Pronghorn were observed in the Twin Peaks area during the early years of OPCNM (Superintendent's Monthly Reports), and a radiocollared animal briefly approached to within about one mile of the campground in 1997 (AGFD unpubl. radiotelemetry data). The continuing maintenance and incremental growth of the Twin Peaks developed area serves to perpetuate a center of human activity, rendering it unavailable as habitat.

In addition to adverse impacts on habitat, some actions treated in Appendices B and C result in major or moderate beneficial impacts on pronghorn habitat. Phasing out mining on the monument and CPNWR reduced surface disturbance and subsistence woodcutting. Phasing out livestock grazing on OPCNM, CPNWR, and BMGR is resulting in widescale rehabilitation of habitat. Wilderness designation on the monument and CPNWR caused closure of informal road networks, resulting in rehabilitation of habitat. Increasing trends in rainfall since the late 1970s likely resulted in more favorable forage conditions. Reducing permanent human habitations in backcountry areas of the monument and CPNWR probably resulted in reduced local impacts from woodcutting and livestock grazing. Beneficial aspects of management plans for CPNWR, BMGR, and the monument have also aided in habitat recovery. Ecological research and monitoring projects should beneficially impact habitat by supporting improved management strategies.

Many of the activities listed and analyzed in Appendices B and C have negligible, minor, or moderate impacts, of local to regional scale. While these actions range from beneficial to adverse, the majority are adverse. Taken together the cumulative impact of these lesser actions is likely to result in moderate to major long-term regional adverse impacts on Sonoran pronghorn habitat.

Overall, the cumulative impacts analyzed in Appendices B and C have probably resulted in net improvements in habitat quality, due to cessation and initial recovery from several key, pervasive, adverse activities, e.g. livestock grazing. At the same time, losses of habitat that are negligible to moderate, and localized to regional in scale, continue to cause incremental loss and modification of habitat. Of critical importance is that major losses of access to habitat have occurred, which amount in a net overall loss of habitat, despite improving quality (see below).

Curtailment of Habitat or Range

The cumulative impacts of the Existing Conditions Alternative (Appendix B), when considered with all other past, present, and reasonably foreseeable future actions (Appendix C), result in curtailment of habitat or range for the Sonoran pronghorn. Individual actions span the range of impacts, from major beneficial to major adverse, from short-term to long-term durations, and vary in geographic scope from localized to widespread. However, several major adverse widespread actions are of greatest significance.

The actions listed in Appendices B and C will impose restrictions on the Sonoran pronghorn's nomadic ecological strategy. The impediments to movement are typical of impediments recognized for other pronghorn subspecies (Ockenfels et al. 1997, van Riper and Ockenfels 1998, Bright and van Riper 2000). It is likely that current barriers to movement will strengthen, and that new barriers may develop which further subdivide or restrict the species' range. Factors that contribute to restrictions on pronghorn range and movements include: Construction of U.S. Interstate 8; construction and gradually increasing use of Mexico Highway 2; potential expansion of Highway 2 from 2 to 4 lanes; construction and gradually increasing use of Highway 85; permanent establishment of a 65-mph speed limit on Highway 85; right-of-way fencing along Highway 85 between Why and Gila Bend; possible future widening of Highway 85 to four lanes; fences between BLM lands in the Ajo area and adjoining OPCNM and CPNWR lands; interior pasture fences on BLM lands in the Ajo area; increasing use and/or development of unpaved roads in OPCNM, CPNWR, and BMGR; establishment of new transportation and utility corridors; recreational activities; military ground developments; establishment of permanent or semi-permanent human occupation in backcountry areas; expansion of communities on the perimeter of pronghorn range (e.g. Lukeville, Why, Ajo, Gila Bend, Sentinel, Dateland, Wellton, Tacna); and establishment of additional physical barriers along International Boundary.

With respect to the monument locally, several types of barriers warrant discussion. Very few barbed-wire fences existed in Sonoran pronghorn habitat on the monument until the 1940s. During the late 1940s and early 1950s, the NPS constructed barbed-wire fences on all sides of its boundary. In addition, a number of interior fences existed to control movements of domestic livestock. The fences constructed by the NPS and other agencies are likely to have had a long-term adverse impacts on Sonoran pronghorn by inhibiting access to and within OPCNM, which although occupied year-round appears to be very important summer habitat (AGFD telemetry data). With the cessation of livestock grazing in the late 1970s, interior barbed-wire fences were taken down and/or allowed to deteriorate. Recognizing the impacts on pronghorn movement, in the late 1980s the monument began taking down its fence marking the boundary with CPNWR. Most of this fence was removed by 1995, with a few remaining stretches removed in 1999. While radiotelemetry data collected by AGFD in the 1990s indicate that pronghorn move freely between the monument and CPNWR, it remains to be confirmed that modifying the north boundary fence has resulted in pronghorn moving between the monument and BLM lands.

Until the late 1930s, the lack of paved roads within the monument allowed Sonoran pronghorn unobstructed access across all suitable habitat within the monument. Highway 85, which was paved in 1943, had a major long-term adverse impact on the Sonoran pronghorn. Pronghorn are reluctant to cross paved roads, especially paved roads with heavy traffic. As traffic volumes (and speed) on Highway 85 have increased steadily since it was paved, pronghorn use of the habitat east of Highway 85 has ceased. These eastern upslope areas of habitat are critical to pronghorn, because the animals move into them during the warm spring and summer months in search of water-containing forage.

These adverse curtailments of pronghorn range are likely to reduce the ability of animals to move freely in search of better forage or habitat conditions, thus limiting their ability to survive even moderate drought.

These adverse impacts may also impose a geographic range so small that its carrying capacity is less than a minimum viable population level of Sonoran pronghorn. Furthermore, curtailments of range may force animals to attempt to cross barriers (e.g. busy highways or fences), sustaining injury or death in the process (See "Mortality," below).

Disturbance or Harassment

The cumulative impacts of the Existing Conditions Alternative (Appendix B), when considered with all other past, present, and reasonably foreseeable future actions (Appendix C), result disturbance and harassment (and some reductions of these impacts) of Sonoran pronghorn. Individual actions span the range of impacts, from major beneficial to major adverse, from short-term to long-term durations, and vary in geographic scope from localized to widespread. These impacts are sufficient in number so that the overall effect is an essentially continual level of minor to major disturbance and harassment, varying from local areas to more regional impacts. This disturbance and harassment may result in physiological stress, excessive movements, and avoidance of areas that might otherwise be preferred habitat. Ultimate consequences may include diminished physical fitness, reduced adult survival, reduced fawn survival, susceptibility to predation, and injuries incurred while fleeing. Several major and moderate actions are summarized below.

The rapid growth in the human population of Arizona and southern California in recent decades has resulted in great increases in human presence in pronghorn range. Recreational use of OPCNM and CPNWR has particularly increased over the last 10 years (See narrative section, Appendix C). Closely related to increasing regional human population, recreational use of the monument, CPNWR, BMGR, and BLM lands has and continues to increase. This brings people in vehicles and on foot into proximity to pronghorn, which is a known disturbance factor (Krausman et al. 2001). Federal agencies tend to facilitate such recreation, by maintaining or improving roads, allowing new informal camping areas, developing interpretive or promotional materials, or increasing allowable (permitted) use levels. In some cases, non-Federal entities also promote increasing recreational use, e.g. feature magazine articles and the Citizen's Initiative to establish Sonoran Desert National Park. Currently, seasonal recreational use is considerable in several areas used often by pronghorn: BLM lands around Ajo; El Camino del Diablo in CPNWR; the North Puerto Blanco Drive and trails in the Puerto Blanco Mountains in the monument. Increasing human populations also results in greater volumes of traffic on roads such as Highway 85, creating local disturbance and a barrier to movement.

In the past decade the U.S. Sonoran pronghorn range has experienced very high and still increasing activities involving Illegal immigration and smuggling. Very high numbers of people are moving generally northward from Mexico toward Interstate 8, Ajo, Gila Bend, and other destinations. These people travel on foot, bicycle, and automobile. Increasingly, automobile traffic is cross-country, establishing new roads through prime pronghorn habitat such as the Growler Valley, San Cristobal Valley, O'Neill Hills, etc. In the monument alone, estimates recently reached 1000 people per night travelling through the monument. This large volume of human presence in pronghorn habitat constitutes a major source of disturbance. In addition, U.S. law enforcement agencies respond to this illegal activity, resulting in additional traffic by automobiles, helicopter, airplane, and people afoot. To the extent that interdiction efforts are successful, they would achieve beneficial reductions in this pervasive form of disturbance.

Extensive military activities have taken place in pronghorn habitat since World War II (Appendix C). These have included both ground-based operations and training in air-to-ground and air-to-air munitions. Krausman et al. (2001) recently found that aircraft overflights of pronghorn did not have great effect on pronghorn, as measured by changes in observable behavior or movements. However, pronghorn in the presence of military activity tended to spend less time foraging than pronghorn without military activities. Krausman et al. (2001) determined that activities on the ground (vehicles, people) had greater discernable effect on pronghorn than did aircraft overflights.

Until recent decades, livestock ranching resulted in considerable human activity in pronghorn habitat. In the monument, activity was concentrated around ranching headquarters at Dos Lomitas, Bates Well, Alamo Canyon and Dowling Well. Periodic concentrated activity also occurred during spring round-ups at Pozo Nuevo, Aguajita, Bates Well, Walls Well, Gachado Well and Pozo Salado. Roundups occurred at

permanent water sites each year during the summer drought when pronghorn's access to water might have been important, and when pronghorn were more likely to be in their eastern range.

Concentrated human activity also occurred at the mines, particularly the Growler, Victoria, Milton and Copper Mountain mines in the monument. Mining activity would have included actions such as blasting and running heavy machinery that would have been heard at long distances. Most of the mining activity, however, was in short-term spurts covering relatively small areas. Currently, mining has essentially ceased in the U.S. range of the pronghorn.

A small village existed at Quitobaquito in the 1940s and 1950s. A few structures housed native Americans and staff of the Bureau of Animal Industry. The last O'odham occupant vacated the area in the late 1950s. Human presence might have caused—and might still cause—pronghorn to avoid this water source. The NPS caused the removal of a village that had established for a short time at Cipriano Well (also called Juan Well). The NPS noted that pronghorn had left the area while it was occupied.

Until the Wilderness Act of 1978, the NPS permitted unobstructed access to roads and trails in the monument. Most visitors probably stayed on maintained roads such as the Ajo Mountain Drive, the Puerto Blanco Drive, and the south boundary road to Quitobaquito. Some visitors used more remote roads such as the Palo Verde Camp Road, the Wall's Well Road, Acuna Valley Road, Cement Tank Road and the west boundary road. Driving in along wash beds was also permitted and preferred by the NPS. All parts of the monument, therefore, were accessible by road to all visitors, ranchers, staff and researchers. The wilderness designation in 1978 had the effect of closing a number of roads. The most notable impact of these road closures on Sonoran pronghorn was to reduce the potential for pronghorn to contact people.

Direct Mortality

The cumulative impacts of the Existing Conditions Alternative (Appendix B), when considered with all other past, present, and reasonably foreseeable future actions (Appendix C), may result in impacts on direct mortality of Sonoran pronghorn. The cumulative impacts of direct mortality of pronghorn are difficult to discern. In general, it is likely that mortality due to human influences was a moderate to major adverse impact in the first part of the 1900s. Hunting (including illegal poaching) was apparently fairly common up to about the middle 1900s (See narrative section of Appendix C). Peak hunting pressure on Sonoran pronghorn was probably during the 1920s through 1940s. Local residents and construction workers were taking an unknown but probably substantial number of pronghorn. In addition, commercial hunting operations (based in Sonoyta) in the 1930s and 1940s were taking at least several pronghorn per year, frequently during the winter season. However, indications are that hunting has decreased and is likely a rare impact currently. As law enforcement presence increases on OPCNM, CPNWR, BLM and BMGR, poaching should be further deterred.

Barbed-wire fences not only restricted the range of Sonoran pronghorn, they directly caused deaths. Although there is only one record of Sonoran pronghorn tangling to death in a fence in the U.S. population, other undocumented deaths may have occurred.

Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

The cumulative impacts of the Existing Conditions Alternative (Appendix B), when considered with all other past, present, and reasonably foreseeable future actions (Appendix C), are minor under this category. Commercial uses of Sonoran pronghorn are not known in the U.S. or Mexico. Similarly, no direct recreational use is apparent, unless visitation to the monument, CPNWR or BMGR for the purpose of viewing pronghorn is considered. The impacts of such recreational visitation are considered above with general recreation, under "Disturbance or Harassment." With regard to scientific use, the capture and radio-collaring operations carried out by AGFD have resulted in deaths of pronghorn in the past. This research effort yields important information regarding habitat use and population trends. The AGFD capture and radio-collaring operations are regulated under permit by the USFWS; the relative costs and benefits continue to be evaluated by those agencies and the Sonoran Pronghorn Recovery Team.

Disease or Predation

The cumulative impacts of the Existing Conditions Alternative (Appendix B), when considered with all other past, present, and reasonably foreseeable future actions (Appendix C), may result in impacts relating to disease and predation. These impacts are both adverse and beneficial, generally minor to moderate in intensity, and local to regional in context.

During the era when CPNWR, CPNWR and BMGR had livestock grazing, there would have been a potential for transmission of disease between domestic livestock and wildlife, including Sonoran pronghorn. High numbers of cattle, coupled with animal concentration areas near water sources, would have created favorable conditions for disease transmission. Part of the rationale for constructing the southern/International boundary fence in the 1940s was to keep out Mexican livestock, partly out of fear of diseases such as Foot-and-Mouth disease. Elimination of domestic livestock from most of the U.S. pronghorn range, and the now isolated nature of the U.S. herd, have probably reduced the risk of disease outbreak. However, the recent European outbreak of Foot-and-Mouth disease, the global trade network, and low Sonoran pronghorn numbers make this threat a contemporary concern.

Little is known regarding the cumulative impacts of predation on Sonoran pronghorn. It is assumed that normal predation pressure takes place, from coyotes, bobcats, and mountain lions. In recent years, examination of the sites of death of several radio-collared pronghorn indicated normal predation by canines and felines. A predator-control program undertaken by the USFWS 1946 until at least 1954 and periodically thereafter was thought to have improved pronghorn numbers, but no population data were gathered to substantiate that conclusion. If providing artificial water sources draws in both pronghorn and predators, artificially increased predation may result. The Sonoran pronghorn Recovery Plan (USFWS 1998) identifies predator control as a potential management strategy to increase fawn survival. In recent years, packs of feral dogs have been observed in the monument, most notably on La Abra Plain and the southern portions of the Puerto Blanco Mountains. It is possible these feral dogs could prey on pronghorn.

Other Natural or Manmade Factors Affecting Its Continued Existence

The cumulative impacts of the Existing Conditions Alternative (Appendix B), when considered with all other past, present, and reasonably foreseeable future actions (Appendix C), may result in other impacts on Sonoran pronghorn. These impacts are both adverse and beneficial, generally minor to moderate in intensity, and local to regional in context.

Drought may have had an impact on Sonoran pronghorn populations over the years. The severe droughts of the 1880s, the 1940s and early 1950s, and the lesser drought of the 1970s may have had significant adverse impacts. However, drought is unlikely to be solely at fault for recent population declines. Southwestern Arizona has had no severe drought in the last quarter-century. Individual dry years have occurred as is normal, most recently the record dry year of 2000. However those dry years have been interspersed among a large number of El Nino Southern Oscillation (ENSO) years of above-average rainfall, especially in the 1980s and 1990s (Rowlands 2000, OPCNM unpubl. climate data). Although substantial year-to-year variations exist, the general trend in the later 20th century has been one of slightly increasing rainfall (Rowlands 2000). Two major ENSO episodes have taken place in the last decade alone: 1992-1993, and another as recently as 1998. The several individual dry years experienced in the later 1990s should not have exerted nearly the adverse impacts that the true droughts of the 1940s and 1950s and the lesser drought of the 1970s did. If recent dry years have had an impact on Sonoran pronghorn, it may be because in recent decades Sonoran pronghorn have much more limited options for coping with even brief moderate drought. Because of restrictions on their movements and range, and increasing human presence within their range, pronghorn are less able to employ their nomadic strategy in search of relief. It is not that drought itself is an impact, but possibly that drought has *become* an impact, due to other factors confounding the species' normal ecological strategy.

Until the last quarter-century, Sonoran pronghorn experienced competition for forage from the livestock grazing that was prevalent on the monument, CPNWR, BMGR, and BLM lands. This impact would have been strongly adverse, long-term, and nearly range-wide. Stocking rates of domestic livestock were so excessive that even woody perennials such as ironwood and mesquite had browse lines. This level of

overgrazing would have severely reduced the quantity and quality of forage available to Sonoran pronghorn. This competition is likely to have resulted in reduced survivorship of adults and fawns, reduced overall fitness, and less than optimal recruitment and survivorship. As noted above, this grazing also resulted in habitat degradation. While Sonoran pronghorn in most of the U.S. range are no longer experiencing direct competition from domestic livestock for forage and water, they are probably still experiencing degraded habitat conditions as a result of the long-term ecological effects of livestock overgrazing in Sonoran Desert ecosystems. Domestic livestock grazing still takes place on BLM lands in the Ajo area, and overuse may be occurring in some areas. In those areas pronghorn would experience direct competition for forage. AGFD radiotelemetry data indicate pronghorn rarely enter actively grazed BLM lands, even though the fences between these BLM lands and the monument and CPNWR have been modified to be pronghorn-passable.

Conclusion

The cumulative impacts of the Existing Conditions Alternative (Appendix B), when considered with all other past, present, and reasonably foreseeable future actions (Appendix C), are likely to result in a continued, incremental reduction in the ability of Sonoran pronghorn to maintain a viable population in the United States. Although there are many beneficial actions included in this cumulative scenario, they are outweighed by adverse impacts. Of the 165 actions analyzed in Appendices B and C, 112 are wholly adverse, 26 are both adverse and beneficial, 27 are wholly beneficial, and 4 have unknown impacts.

In summary, it is likely that over the past quarter-century the quality of Sonoran pronghorn habitat has improved, but over the past 100 years pronghorn have experienced increasing restrictions on their range, and increasing exposure to potentially disturbing human activities. Regionally, in the early 1900s southwestern Arizona was a remote area with little human presence and few improved roads. However, extractive land uses such as grazing, mining, and woodcutting resulted in regionally degraded habitat conditions. Commercial and subsistence hunting placed a further stress on the Sonoran pronghorn. Severe droughts occurred in the 1880s and again in the 1940s and 1950s. By the latter decades of the 20th century habitat conditions were improving, but pronghorn were confined to a smaller area. Actions and activities in the foreseeable future would generally perpetuate these trends. Sonoran pronghorn habitat is likely to continue to improve in quality, because livestock grazing, mining, woodcutting, and other large-scale extractive uses that impacted habitat would remain excluded. These gradual gains in habitat quality would be partially offset by losses due to incremental habitat destruction and modification. However, the net beneficial aspects of habitat improvement are likely to be more than offset by adverse impacts of disturbance and curtailment of range. The clear trend is toward increasing frequency and types of human activities in Sonoran pronghorn habitat and range. Various actions and activities would continue to restrict pronghorn movements, although probably by smaller increments than did the construction of the highways that form the primary boundaries of their range. With increasing use and/or changes in status, some roads may become movement barriers and further reduce the size of the current range. The net adverse impacts of habitat, disturbance, and range restrictions are evident in the trend of Sonoran pronghorn over recent years. Despite conditions that should have substantially improved habitat conditions over the past 25 to 50 years, the population has not grown. Conversely, it recently diminished from approximately 140 animals to 98, between 1998 and 2000 (Hervet et al. 1997 and AGFD unpubl. data). This trend indicates that some influences are having very adverse impacts, to the extent that they override improving habitat conditions. For many actions and projects considered here, the impacts are often difficult to anticipate, much less quantify. And while many projects have negligible impacts on their own, the sheer number of these actions is likely to have major adverse impacts in aggregate. These adverse impacts are felt to the extent that the current population level of 98 animals is considered by the Sonoran Pronghorn Recovery Team to be critically low.

Although the NPS contributes to a fraction of the overall impact on Sonoran pronghorn, increasing human presence in the form of monument visitors; undocumented aliens; travelers on Highway 85; and law enforcement officers; constitute the greatest amount of adverse impacts on the pronghorn that the monument adds to the cumulative scenario.

Findings on Impairment

The purpose of Organ Pipe Cactus National Monument is founded on the monument's enabling legislation as well as the NPS Organic Act of 1916. Purpose statements further define the desired future of the monument as well as serve as guidelines for its management. The following purpose statements were created during the GMP/DCP/EIS planning process and are reaffirmed in the monument's 1997-2002 Strategic Plan.

Organ Pipe Cactus National Monument was created to:

- Perpetuate for future generations a representative sample of the natural and cultural resources and processes of the Sonoran Desert and provide for public understanding, use, and enjoyment of same.
- Preserve for future use and enjoyment the character and values of designated wilderness within the monument.
- Serve as a natural outdoor laboratory for understanding and managing Sonoran Desert ecosystems.
- Serve as a baseline indicator against which environmental changes can be identified.

The Sonoran pronghorn is a species unique to the Sonoran Desert and an integral part of the Sonoran Desert ecosystem. The pronghorn is not, however, key to the natural or cultural integrity of Organ Pipe Cactus National Monument or to opportunities for enjoyment thereof. The General Management Plan does not contain any additional specific goals to protect the pronghorn.

The cumulative impacts of this alternative have been determined to result in major adverse effects to the existing and future Sonoran pronghorn population in the United States. The loss of one or more Sonoran pronghorn would be a major adverse effect to a park resource. However, that loss would not be an impairment of park resources and values.

Impacts on the Sonoran Pronghorn from Alternative B: *The New Proposed Action*

Impact Analysis

The impacts of Alternative B: *The New Preferred Action* Alternative are summarized and analyzed in Appendix D. Each individual action is briefly described, along with how each action may impact Sonoran pronghorn. The impacts of each action are then characterized using the terms (type, duration and intensity) described in the methodology presented above. In addition to the detailed analysis presented in Appendix D, the following section summarizes the ways in which the cumulative impacts of Alternative B differ from the impacts of Alternative A, the *Existing Conditions* Alternative, in their impacts on Sonoran pronghorn (See also "Impacts on the Sonoran Pronghorn from Alternative A, the Existing Conditions Alternative," above). Once again, discussions are grouped under the major impact types identified above under "Affected Environment."

Loss or Modification of Habitat

Impacts would be the same as for Alternative A: Existing Conditions, with these exceptions:

- Some potential beneficial habitat impacts would accrue, if the NPS acquires 1,280 acres of State land. Half this acreage is an area known to be used by pronghorn; the other half provides suitable summer habitat, but lies east of Highway 85. Under NPS ownership these lands may be better preserved as pronghorn habitat.
- Some adverse impacts to habitat may result, if the Twin Peaks development area is expanded.

Curtailment of Habitat or Range

Impacts would be the same as for Alternative A: Existing Conditions, with these exceptions:

- Management of Highway 85 may either reduce or increase barrier effect on pronghorn movements

Disturbance or Harassment

Impacts would be the same as for Alternative A: Existing Conditions, with these exceptions:

- A change to national park status may result in increased visitation and human presence in pronghorn habitat, causing moderate to major, long-term, regional adverse disturbance impacts.
- Expansion of the Twin Peaks development area would result in increased size and scope of human presence, resulting in moderate, long-term, localized disturbance of pronghorn.
- Interpretive waysides along Highway 85 may result in increased visitor entries into the adjacent pronghorn habitat, causing minor to moderate, short-term, localized disturbance.
- Relocating the powerline corridor may result in reducing use of this corridor by UDAs and smugglers, resulting in moderate, long-term, regional beneficial reductions in disturbance.
- Maintaining and/or adding hiking trails is likely to maintain or increase visitor presence in pronghorn habitat, resulting in long-term, moderate, adverse, regional disturbance impacts.
- Efforts to manage aircraft overflights may result in reductions in overflights of pronghorn habitat, and would then result in long-term, moderate, beneficial, regional reductions in disturbance.

Direct Mortality

Impacts would be the same as for Alternative A: Existing Conditions.

Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Impacts would be the same as for Alternative A: Existing Conditions.

Disease, Predation

Impacts would be the same as for Alternative A: Existing Conditions.

Other Natural or Manmade Factors Affecting Its Continued Existence

Impacts would be the same as for Alternative A: Existing Conditions.

Cumulative Impacts

The impacts of all other past, present, and reasonably foreseeable future actions, for the NPS and all other agencies and entities, are discussed and analyzed in Appendix C. Each individual action is briefly described, along with how each action may impact Sonoran pronghorn. The impacts of each action are then characterized using the terms (type, duration and intensity) described in the methodology presented above. The cumulative impacts of all those actions, when added to the impacts Alternative B, *The New Proposed Action* Alternative, are addressed here. In addition to the analyses presented in Appendices C and D, the following section summarizes the ways in which the cumulative impacts of Alternative B differ from the impacts of Alternative A, the *Existing Conditions* Alternative, in their impacts on Sonoran pronghorn (See "Impacts on the Sonoran Pronghorn from Alternative B: The New Preferred Action Alternative," and the "Cumulative Impacts" discussion for Alternative A, above). Once again, the discussion is grouped under the major impact types discussed above under "Affected Environment."

Loss or Modification of Habitat

Cumulative impacts would be the same as for Alternative A: Existing Conditions, with these exceptions:

- A potentially higher level of conservation and protection would be gained for 1,280 acres of State land, if they were acquired by the NPS. Half this acreage is an area known to be used by pronghorn; the other half provides suitable summer habitat, but lies east of Highway 85.

Curtailment of Habitat or Range

Cumulative impacts would be the essentially the same as for Alternative A: Existing Conditions.

Disturbance or Harassment

Cumulative impacts would be the same as for Alternative A: Existing Conditions, with these exceptions:

Adverse disturbance impacts would be increased due to:

- A change to national park status may result in increased visitation and human presence in pronghorn habitat, causing moderate to major, long-term, regional adverse disturbance impacts.
- Expansion of the Twin Peaks development area would result in increased size and scope of human presence, resulting in moderate, long-term, localized disturbance of pronghorn.
- Interpretive waysides along Highway 85 may result in increased visitor entries into the adjacent pronghorn habitat, causing minor to moderate, short-term, localized disturbance.
- Maintaining and/or adding hiking trails is likely to maintain or increase visitor presence in pronghorn habitat, resulting in long-term, moderate, adverse, regional disturbance impacts.

Adverse disturbance impacts would be decreased due to:

- Relocating the powerline corridor may result in reducing use of this corridor by UDAs and smugglers, resulting in moderate, long-term, beneficial regional reductions in disturbance.
- Efforts to manage aircraft overflights may result in reductions in overflights of pronghorn habitat, and would then result in long-term, moderate, beneficial, regional reductions in disturbance.

Direct Mortality

Cumulative impacts would be the same as for Alternative A: Existing Conditions.

Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Cumulative impacts would be the same as for Alternative A: Existing Conditions.

Disease or Predation

Cumulative impacts would be the same as for Alternative A: Existing Conditions.

Other Natural or Manmade Factors Affecting Its Continued Existence

Cumulative impacts would be the same as for Alternative A: Existing Conditions.

Conclusion

Concluding remarks regarding cumulative impacts would be the same as for Alternative A: Existing Conditions.

Findings on impairment

The findings on impairment under this alternative would be the same as for Alternative A: Existing Conditions

CONSULTATION/COORDINATION

History of Public Involvement

On February 27, 2001, agencies involved in the lawsuit met at the U.S. Fish and Wildlife Service office in Phoenix to discuss compilation of environmental baseline data for the Sonoran pronghorn. Agencies attending were: USFWS, Bureau of Land Management, Arizona National Guard, National Park Service, U.S. Marine Corps, U.S. Air Force, and a GIS contractor to the U.S. Air Force. Discussions involved the results of the litigation, action area, data needs, use of GIS to compile the data needs, and a review of existing environmental baseline information. On March 29, 2001 another meeting of agencies involved in performing environmental analyses remanded by the Court met at the Gila Bend Air Force Auxiliary Field in Gila Bend, Arizona. This meeting was organized by the U.S. Marine Corps, to coordinate the USMC's supplemental EIS with cooperating and other affected agencies. Discussions included the proposed schedule for the USMC SEIS, the study area, and projects to be considered in cumulative impacts. Attendees included the USMC, USFA, BLM, USFWS, NPS, Arizona Game and Fish Department, and the consulting firm URS.

The Notice of Intent (NOI) to prepare an environmental impact statement was published in the Federal Register on April 26, 2001. The NOI informed the public of a 30-comment period regarding preparation of this supplement. Concurrently, the NPS sent out 454 scoping letters to federal agencies, and affected or interested organizations and individuals informing them of the process, explaining the issues, and inviting them to offer any comments on either. Fourteen letters were received on or before May 25, 2001, the day the comment period closed. Twelve letters offered comments on past, present, and future actions, while two letters contained addresses which to mail future correspondence.

The comment letters focused mainly on present or ongoing actions that are believe to affect Sonoran pronghorn, including increasing use on State Route 85 and the 1997 speed limit increase (from 55 mph to 65 mph); cattle grazing on adjacent BLM lands; the increase/presence of undocumented aliens using the monument; Border Patrol impacts resulting from control of illegal border activities; adjacent military activities/practices; and increasing visitation, particularly in the backcountry. Additional comments include concerns over potential conservation actions that may impact commerce between Mexico and the United States; daily, on-going activities in Mexico that may have impacts on Sonoran pronghorn habitat; and suggestions on alternative Sonoran pronghorn management techniques.

These concerns have been evaluated in Appendices B-D and the results have been included in the cumulative effects analysis and conclusions sections of this document.

Preparers

Organ Pipe Cactus National Monument

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Bill Mikus, Chief of Maintenance
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Sue Rutman, Natural Resource Specialist

Intermountain Support Office, Denver CO

Laurie Domler, NEPA/106 Specialist
Chris Turk, Regional Environmental Coordinator

List of Recipients (Scoping Letter)

Federal Agencies (U.S.)

BIA- Papago Indian Agency
Bureau of Land Management
Coronado National Memorial
Luke Air Force Base
National Park Service Denver Service Center
National Park Service Mexico Affairs Office
National Park Service Western Archeological & Conservation Center
National Park Service Southern Arizona Group Office
Saguaro National Park
U.S. Border Patrol
U.S. Congressional Delegation for Arizona
Sen. John Kyl
Sen. John McCain
Rep. J.D. Hayworth
Rep. Jim Kolbe
Rep. Ed Pastor
Rep. Robert Stump
U.S. Customs Service
U.S. Dept of Agriculture- Natural Resources Conservation Service
U.S. Department of Justice
U.S. Environmental Protection Agency, Region IX
U.S. Fish and Wildlife Service
U.S. Geological Service- Sonoran Desert Field Station
U. S. State Department--United States/Mexico Border Affairs

Mexican Agencies

Alto Golfo Biosphere Reserve
El Pinacate y Gran Desierto Biosphere Reserve
El Vizcaino Biosphere Reserve
Secretaria de Agricultura y Recursos Hidraulicos
Secretaria de Fomento Alturismo
Secretaria de Desarrollo Economico y Productividad

The Hopi Nation

The Tohono O'odham Nation

Chairman
Department of Disease Control
Executive Branch
Health Department
Hia-Ced Program

O'odham in Mexico Office

Water Resources Department

Cultural Preservation Committee

District Governments

Chairperson, Baboquivari District
Chairperson, Chukut Kuk District
Vice Chairman, Chukut Kuk District
Chairman, Gu Achi District
Vice Chairman, Gu Achi District
Chairman, Gu Vo District
Chairman, Hickiwan District
Vice Chairwoman, Hickiwan District
Chairwoman, Pisinemo District
Vice Chairwoman, Pisinemo District
Chairwoman, San Lucy District
Vice Chairman, San Lucy District
Chairman, San Xavier District
Chairperson, Schuk Toak District
Vice Chairwoman, Schuk Toak District
Chairman, Sells District
Vice Chairman, Sells District
Chairwoman, Sif Oidak District

Tohono O'odham Legislative Branch

Baboquivari District
Chukut Kuk District
Gu Achi District
Go Vo District
Hickiwan District
Pisinemo District
San Lucy District
San Xavier District
Schuk Toak District
Sells District
Sif Oidak District

State and Local Agencies

Arizona Governor Jane Hull
Arizona Department of Tourism
Arizona Department of Agriculture
Arizona Department of Environmental Quality
Arizona Department of Transportation
Arizona Department of Transportation
Arizona Game and Fish Department
Arizona Game and Fish Department
Arizona Department of Commerce
Arizona State Clearinghouse
Arizona State Land Department
Arizona State Museum
AZ State Representative Elaine Richardson
Commission on Arizona Environment (State)
Pima County Parks and Recreation
Pima County Community Services Department
Pima County Economic Development Administrator
Pima Association of Governments

Pima County Board of Supervisors
Tucson Public Library, Ajo Branch
Western Pima County Coordinating
Committee
Yuma County Chamber of Commerce

Organizations

Ajo District Chamber of Commerce
Arizona Public Service Company, West
Valley District
Arizona-Mexico Border Health Foundation
Arizona-Sonora Desert Museum
Audubon Society, Tucson Chapter
Border Research Institute
Center for Biological Diversity
Colorado State University Library
Dames & Moore Environmental Consultants
Defenders of Wildlife
Intercultural Center for the Study of Deserts
& Oceans (CEDO)
Kaibab Forest Products Company
Land and Water Fund of the Rockies
La Ruta de Sonora
National Parks and Conservation Association
Pima Trails Association

Pronatura
Sierra Club, Tucson and Grand Canyon
Chapters
Sonoran Arthropod Studies Institute
Southwest Natural Resource Management
Consultants
Southwest Parks & Monuments Association
The Arizona Nature Conservancy
The Lukeville Economic & Environment
Association
The Sonoran Institute
The Wilderness Society
The Wildlife Society, Arizona Chapter
United Nations Man & the Biosphere
Program
Why Utility Company

Newspapers

Ajo Copper News
Rocky Point Times
The Arizona Republic
The Gilbert Tribune
The Runner
The Tucson Citizen

Individuals

A scoping letter was sent to 212 individuals. A complete listing of these names is available from the Superintendent, Organ Pipe Cactus National Monument, 10 Organ Pipe Drive, Ajo, AZ 85321.

Appendix A. Organ Pipe Cactus National Monument Biological Assessment and Final Opinion

The following biological assessment appears as it was sent to the U.S. Fish and Wildlife Service as part of formal consultation regarding the potential affects of the proposed plan on endangered species in the monument. Also, the Final Opinion of the Fish and Wildlife Service is printed.

BIOLOGICAL ASSESSMENT

Effects of the Organ Pipe Cactus National Monument General Management Plan
on Threatened and Endangered Species

INTRODUCTION

The National Park Service (NPS) has recently prepared a Draft General Management Plan/Development Concept Plans/Environmental Impact Statement (May, 1995), and a Supplement to the Draft General Management Plan/Development Concept Plans/Environmental Impact Statement (April 1996) for Organ Pipe Cactus National Monument, Pima County, Arizona. The purpose of a general management plan is to guide future management of a park or other NPS unit for the next 10-15 years. Actions proposed in the plan are general in nature and present a program for comprehensive management of resources and visitor use.

The programmatic nature of many proposals contained in general management plans makes it difficult to quantify actions or environmental impacts. Consequently, before implementing some actions, more detailed plans would be prepared, and the specific consequences of the projects analyzed in compliance with the National Environmental Policy Act and other federal laws and regulations. Additional planning and analysis may also determine the need for further Section 7 consultation for some threatened and endangered species.

Some of the actions proposed in the General Management Plan (hereafter referred to as the GMP) include:

- working with the Arizona Department of Transportation to ensure continued travel and commerce while enhancing resource protection along the State Route 85 corridor within the monument
- seeking redesignation of the monument to Sonoran Desert National Park
- establishing partnerships with federal agencies and private organizations to share facilities, staff, and costs in the Why and Lukeville areas
- proposing an increase in designated wilderness and development of an interagency (National Park Service, Bureau of Land Management, and Fish and Wildlife Service) regional wilderness and backcountry management plan to coordinate and enhance protection of wilderness-related values
- re-aligning the trail network in the Quitobaquito Springs area
- retaining existing development in the Twin Peaks area with some additions and change in the use of some buildings
- increasing the amount of primitive camping and designated trails in the monument
- full implementation of the monument's Natural and Cultural Resources Management Plan

Section 7 of the Endangered Species Act, as amended, prohibits federal agencies such as the NPS from implementing any action that is likely to jeopardize the continued existence of a federally protected (i.e., endangered, threatened) species. Furthermore, the act requires that the NPS consult with the Fish and Wildlife Service (FWS) on any action it authorizes, funds, or executes that could potentially affect a protected species or its designated critical habitat. To help meet its responsibilities under the Act, this

biological assessment evaluates the effects of the GMP on listed and proposed species known to occur within the boundaries of Organ Pipe Cactus National Monument.

Based on information received from the FWS's Arizona Ecological Services State Office (FWS reference: AESO/SE 2-21-89-I-078; dated March 29, 1995), and verified by the NPS, the following listed species, all endangered, are known to occur within the monument and are addressed in this biological assessment: lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*), Sonoran pronghorn (*Antilocapra americana sonoriensis*), and desert pupfish (*Cyprinodon macularis*). Also known to occur within the monument is the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*), which is proposed for listing as endangered. Proposed critical habitat for this owl has been identified in the vicinity of Alamo Canyon.

The NPS has determined that actions proposed in the GMP would have no effect on the American peregrine falcon (*Falco peregrinus anatum*) or brown pelican (*Pelecanus occidentalis*), both of which are endangered and known to occur within the monument. The brown pelican is a very rare visitor with only four reported sightings, the last of which occurred in July 1972 at Quitobaquito Pond (Groschupf et al. 1988). The peregrine falcon is a rare transient with no confirmed breeding accounts, although breeding habitat exists in remote backcountry areas of the monument. None of the actions proposed in the GMP would result in long-term effects on habitat or prey for either species.

LESSER LONG-NOSED BAT

The lesser-long nosed bat is a seasonal resident in the monument, occurring between April and September. In 1989, the largest known maternity colony in the U.S., consisting of approximately 20,000 bats, was discovered roosting in an abandoned mine adit (Copper Mountain Mine) near Alamo Canyon. Through coordination with the FWS, the NPS has instituted an annual monitoring program to obtain data on the colony including its size, productivity, diet, and habitat requirements.

Proposed Actions That May Affect the Lesser Long-Nosed Bat

Three actions proposed in the GMP have the potential to increase visitor use in the Alamo Canyon area and could possibly lead to human disturbance at the nearby maternity roost. These actions include:

- expanding the campground by four sites
- establishing a formal day-use parking area
- formalizing an existing social trail (an old road scar) into a designated trail

Visitor surveys and demand for camping at the Alamo Canyon Wash campground show increasing interest in a primitive camping experience, accessible by vehicle. During the heavy use period (late October through mid-April), this campground is almost always full. The existing campground currently contains four campsites, a composting/vault toilet, and a large parking area. Each campsite has a maximum user capacity of four persons per site, for a total campground capacity of 20 campers. To help accommodate visitor demand, the GMP proposes to expand this campground. A cluster of four campsites would be added, each containing a parking space (approximately 12' x 22'), picnic table (standard 6' in length), and cleared area for a tent (approximately 20' x 20'). No water would be provided. Depending on the distance to the existing campground, one composting or portable vault toilet would be installed in the area of the new campsites. The sites would be located within the non-wilderness road corridor (150 feet from either side of road centerline), in previously disturbed areas, to the extent possible, and somewhat separated from other sites to offer a sense of privacy. Approximately 0.1 acre of vegetation could be impacted by campground expansion.

Currently, a compacted area (roughly 3,500 square feet in size), encircled by large rocks, is located at the end of the access road and serves as a day-use parking and vehicle turn-around area. The GMP proposes to better delineate this parking area while restricting ground disturbance to the roadbed. To further manage visitor use, the existing social trail that follows an old road scar along the wash would be

formalized into a designated hiking trail, about 2.25 miles in length. Because the parking area and trail would be constructed on previously disturbed ground, there would be no additional vegetation removed.

Analysis

The highly gregarious roosting behavior of the lesser long-nosed bat makes it vulnerable to catastrophic population loss caused by human disturbance (FWS 1993a). Such disturbance could have a potentially adverse effect on the species' survival if it resulted in abandonment of a major roost or a decline in juvenile survivorship or recruitment. The proximity of the maternity roost to Alamo Canyon campground, located 2.25 miles away, coupled with the fact that features such as mine adits are attractive destinations for hikers, increases the potential for human disturbance at the roost site.

Previous indications are that little, if any visitation presently occurs at the maternity roost, particularly at the time of year when bats are roosting. Moreover, the nondescript nature and hazardous appearance of the adit discourages all but the most determined hikers from visiting the site. (The entrance to the adit is fenced with four-strand barbed wire and signed in both Spanish and English as a dangerous site.) Although campground expansion and trail development are likely to lead to increased visitation and prolonged visitor stays in Alamo Canyon, these actions are not expected to result in disturbance to the nearby maternity colony of lesser long-nosed bats.

As outlined in the draft recovery plan for the lesser long-nosed bat (FWS 1993a), recovery actions should stress protection of known roosts, determination of foraging and mating behavior, population monitoring, and public education. The NPS is assisting in recovery efforts through ongoing monitoring of the maternity roost, protecting all potential roost sites and food plants within the monument, and educating visitors about the ecological importance of bats.

Reasonable and Prudent Measures Proposed

To ensure that management actions such as campground expansion do not result in adverse effects on the lesser long-nosed bat, the NPS would continue to monitor human disturbance at the roost. If monitoring reveals that human activity has become a problem at the site, the NPS would reconsider the appropriateness of campground expansion as well as the need for visitor use restrictions in the Alamo Canyon area.

Determination of Effect

Increased visitor use of the Alamo Canyon area resulting from campground expansion and trail development is expected to have no effect on the nearby maternity colony of lesser long-nosed bats for the following reasons: (1) visitation to the monument and use of Alamo Canyon is relatively low during the time of year that bats are roosting; and (2) the remote location and nondescript nature of the adit would discourage all but the most determined hikers from visiting the roost. Moreover, continuation of the annual monitoring program would aid in recovery efforts for this species.

SONORAN PRONGHORN

Organ Pipe Cactus National Monument is within the historic range of the Sonoran pronghorn. Prior to a recent verified sighting of two pronghorns just west of State Route 85 near the Alamo Canyon road in mid-August 1995 (Organ Pipe Cactus Natl. Mon., unpublished data), the last verified observation of a pronghorn near this highway was a carcass found on Ajo Mountain Drive in 1972. (There is an unconfirmed report of four Sonoran pronghorn crossing State Route 85 in August 1993, approximately 1.5 km north of the monument visitor center.) Although observations along State Route 85 have been limited in past decades, pronghorns were supposedly not uncommon along the highway and throughout the Sonoyta Valley as recently as the 1960s (H. Coss, pers. comm.). Long-time Ajo residents reported

seeing more Sonoran pronghorn along the highway near Ajo and south in the Valley of the Ajo in previous decades (FWS 1994).

Proposed Actions That May Affect the Sonoran Pronghorn

There are no actions proposed in the GMP that would directly affect the Sonoran pronghorn. All proposed facilities would be located within areas of existing development (e.g. Twin Peaks, Lukeville, and Quitobaquito Springs) and would involve relatively small tracts of land surrounded by larger areas of undisturbed habitat. Consequently, there would be no significant loss of pronghorn habitat, nor would new construction significantly modify pronghorn behavior or habitat use.

However, increased visitor use may lead to indirect effects on the Sonoran pronghorn. Increased use of some front- and backcountry areas has the potential to adversely affect pronghorn if it causes an alteration in behavior and habitat use. Increased visitation to the monument is also expected to result in increased traffic along State Route 85, adding to the barrier effect that existing traffic patterns already present to pronghorn movements.

Approximately 22 miles of State Route 85 lie within the monument. The Arizona Department of Transportation (ADOT) maintains the road and shoulders within the monument under an 1941 Cooperative Agreement with the State and Pima County that applies to an area extending 33 feet from each side of the road centerline. ADOT is also responsible for establishing the speed limit and performing road improvements along the highway. Under a separate agreement, the State of Arizona Department of Public Safety and the NPS share responsibility for patrolling the road and enforcing the posted speed limit of 55 mph within the monument.

The international port-of-entry at Lukeville is open from 6:00 a.m. until midnight each day. Average daily traffic on the road fluctuates, but has generally increased in recent years. In 1992, ADOT reported average daily traffic counts of 940 vehicles on the section of State Route 85 within the monument; in 1993 average daily traffic along this same section of highway fell to 728 vehicles, and in 1994, rose to 964 vehicles. Less than 25% of this traffic is attributed to monument visitors (Organ Pipe Cactus Natl. Mon., unpublished data).

Reasons for the increase in traffic are due to increased tourism in the region, including the Puerto Peñasco area in northern Sonora, Mexico; the North American Free Trade Agreement (NAFTA); and increased visitation to the monument. Actions proposed in the GMP that could further increase visitation and use of State Route 85 involve expanded visitor services and recreational opportunities including an increase in the number of trails (approximately 9 additional miles) and primitive camping opportunities (4 sites at Alamo Canyon campground and approximately 20 walk-in sites in the Twin Peaks area), as well as additional facilities offering interpretation and information to visitors particularly in the Why and Lukeville areas. Redesignation of the monument to national park status is expected to cause a temporary surge in visitation. However, it is unknown if the increase would be long-term.

Analysis

Observations of pronghorn movements suggest that traffic along State Route 85 acts as a barrier to pronghorn, restricting their movements to areas west of the highway (see attachment depicting regional pronghorn locations). Not only is the highway a deterrent to expanding pronghorn populations, but the resulting modified behavior patterns may lead to a reduction in genetic exchange, reduced viability, and the ability to adapt to environmental change. Mexico's Highway 2, located a short distance from the monument's southern boundary, as well as Interstate-8 to the north, present similar impediments to desert pronghorn (Ockenfels et al. 1996).

The NPS has examined the effectiveness of various mitigation strategies at reducing the barrier that State Route 85 currently presents to pronghorn. Eleven methods traditionally used to decrease wildlife-vehicle accidents and facilitate safe passage across highways were examined. These methods included driver

education, speed and traffic volume reductions, vegetation removal along road shoulders, construction of underpasses and overpasses, and the use of fencing, lighting, warning signs, reflectors, and ultrasonic devices. Although past research has generally been limited to cervids, it is assumed that the behavioral response to such measures is probably similar among all ungulates (D. Reed, pers. comm.).

Several methods were dismissed from further consideration due to their impracticality (e.g., installation of ultrasonic devices on vehicles), or because of their incompatibility with the monument's wilderness values (e.g., highway lighting would be a source of light pollution and degrade night sky visibility; overpasses would provide a visual intrusion that would be conspicuous from many miles away [they would have to be at least 4.25 meters high to allow commercial trucks to pass safely beneath]). Other measures were dropped from consideration due to public controversy and because they were beyond the NPS's control (e.g., speed limit reductions; reducing traffic volume by rerouting non-monument traffic outside the park). Because fenced highways have been shown to fragment pronghorn habitat and isolate herds (Ockenfels et al. 1996), this technique was also dismissed from further study. Of the methods being considered for implementation (driver education, construction of underpasses, vegetation removal along road shoulders, use of warning signs and reflectors), a discussion of the effectiveness of each technique is provided below. This analysis is based largely on a review of the literature as well as discussions with biologists knowledgeable in the use of these techniques.

Driver Education

Del Frate and Spraker (1991) reported that a public awareness program on the Kenai Peninsula in Alaska increased motorists' understanding of the potential hazards of encountering moose on Peninsula roads. However, it is uncertain whether this measure was directly responsible for a reduction in roadkills. Reed (1985) hypothesizes that even with intensive driver education, the reduction of cervid-vehicle accidents under real conditions would be minimal since the demands of driving under nighttime conditions typically exceed the motorist's visual alertness and physical capabilities.

Construction of Underpasses

Wildlife underpasses have been shown to be effective at facilitating safe passage of cervids across highways, when designed and constructed with adequate openness. Reed (1985) referred to the primary stimulus of a given underpass to approaching cervids as the "openness effect", calculated as: height x width (or open-end surface area)/length. The greater the "openness effect", the greater the potential for use of a particular underpass.

Conversely, the confining characteristics of relatively long and narrow underpasses may prevent some animals from using these structures. Although underpasses would be most effective along State Route 85 in areas of known wildlife use, such as xeroriparian corridors, some pronghorn may have difficulty locating or simply refuse to enter underpasses. Moreover, any gains experienced by ensuring safe passage across the highway could be offset by a potential increase in predator-related mortality. Such structures could serve as a predator trap, allowing mountain lions and coyotes to successfully ambush pronghorn at underpass openings.

Vegetation Removal along Road Shoulders

Since removing vegetation along the shoulders of State Route 85 would result in a slight widening of the road corridor, it may also increase the barrier that the highway presents to pronghorn. Although limited research has been conducted on the effects of vegetation removal at reducing cervid-vehicle accidents, Pojar (1971) reported that clearing roadside vegetation did not significantly reduce the number of accidents despite increased motorist visibility and reduced cover for deer.

Use of Warning Signs

Of the five studies cited by Reed (1985), motorists' responses to warning signs were insufficient to affect the frequency of cervid-vehicle accidents along roadways. Although Mansfield and Miller (1975) reported that 76- by 76-cm symbol type warning signs reduced deer-vehicle accidents in 11 of 19 study areas in

California, only 2 of these areas revealed a significant difference in accident numbers. Nor were lighted, animated deer crossing signs effective at significantly reducing deer-vehicle accidents in Colorado (Pojar et al. 1975). Similarly, game crossing signs were shown to have little or no effect on vehicle speeds in Sweden (Edholm and Kolsrud 1960, Aberg 1981) despite being noticed by 60 percent of passing motorists (Johansson and Backlund 1970).

Use of Reflectors

Reed (1985) reports limited research on the effectiveness of wildlife reflectors at reducing cervid-vehicle accidents. Gordon (1969) and Almkvist et al. (1980) indicated that stainless steel mirrors were ineffective at reducing accidents. Studies of Swareflex reflectors revealed conflicting results with some studies citing their effectiveness (Morris, pers. comm. [cited in Reed 1985], Schafer and Penland 1985), while others note their ineffectiveness (Woodard et al. 1973, Ossinger and Schafer 1992) at reducing cervid-vehicle accidents. Moreover, Zacks (1986) found that white-tailed deer (*Odocoileus virginianus*) did not evade or overtly respond to red light, the basic premise underlying the use of Swareflex reflectors.

Conclusion. Despite efforts to educate motorists, enforce the existing speed limit, and create underpasses to facilitate safe passage across State Route 85, such measures may do little in alleviating the barrier that existing and future traffic patterns will present to Sonoran pronghorn. Pronghorn may still avoid the highway corridor due to the visual and noise disturbance associated with the heavy volume of traffic travelling at high speeds. Elevated heart rates have been correlated with auditory or visual disturbance among pronghorn (Thompson et al. 1968, Cherkovich and Tatoyan 1973, Moen et al. 1978 [cited in FWS 1994]). Hughes and Smith (1990) reported flight distances of 400-500 meters in response to an approaching vehicle. A continued increase in traffic levels along this highway due in part, to an anticipated increase in monument visitation, may adversely affect the Sonoran pronghorn by continuing to restrict pronghorn movements, which could lead to a reduction in genetic exchange and reduced viability, potentially eliminating populations from this portion of their range.

Reasonable and Prudent Measures Proposed

Most of the mitigation techniques studied to date have focused on reducing cervid-vehicle accidents, and not on alleviating the barrier that roadways may present to wildlife, particularly ungulates. To better facilitate pronghorn movements across highways and railroad rights-of-way, Ockenfels et al. (1996) recommend the following mitigation measures: (1) eliminate fences from known movement corridors; (2) move fences farther away from rights-of-way; (3) construct expansive underpasses or overpasses over rights-of-way; and (4) relocate rights-of-way out of pronghorn habitat. They also suggest that if none of these measures prove effective, translocating pronghorn may be the only solution to maintaining gene flow and supplementing numbers in isolated herds.

Because ADOT is responsible for all road improvements and maintenance along State Route 85, any mitigation practices undertaken within their perpetual easement (33 feet from either side of the road centerline) must be done with full approval of that agency. Consequently, methods suggested in this document are those that the NPS would like to see implemented along the road corridor, subject to the state's approval. To help promote cooperative efforts, the NPS would pursue an agreement between the two agencies to (1) establish a vehicle for continued communication regarding road-related issues; (2) construct underpasses at known movement corridors to facilitate safe passage of pronghorn across the highway; and (3) establish a program to explore other measures to better understand and subsequently reduce the impacts of State Route 85 on pronghorn. In the meantime, the NPS would continue working with the Arizona Department of Public Safety to enforce the existing speed limit within the monument.

Of the mitigation techniques evaluated, construction of underpasses at known movement corridors along the highway shows the greatest promise at reducing the barrier that State Route 85 presents to pronghorn. The NPS would work with the FWS, including biologists from the Cabeza Prieta National Wildlife Refuge, as well as personnel from the Arizona Department of Transportation, to determine the

feasibility, best location(s), and optimum design for underpasses. (One potential location for an underpass is near miles 65-67, in an area dominated by chainfruit cholla [*Opuntia fulgida*]; habitat that appears to be particularly important to pronghorn during periods of limited water availability [L. Thompson-Olais, pers. comm.]).

To help reduce the barrier that fences present to pronghorn, the top strand of barbed wire on the monument's northern boundary fence would be replaced with smooth wire (the bottom strand has already been replaced) to facilitate pronghorn movements between the monument and Cabeza Prieta National Wildlife Refuge. Similar modifications would be made to the monument's southern boundary fence to encourage pronghorn movements between the monument and Mexico.

An effort also would be made to educate motorists about the plight of pronghorn using a variety of interpretive media. Some of the techniques to be employed include the use of signs and wayside exhibits particularly at the north and south entrances to the monument and along the highway corridor. It is hoped that these efforts would elicit lower speeds and increased awareness among motorists. Although such actions may do little in alleviating the barrier that the roadway currently presents to pronghorn, it may provide a greater benefit to monument fauna by reducing wildlife-vehicle accidents along the road corridor.

Key components of the recently revised draft recovery plan for the Sonoran pronghorn include monitoring the present U.S. population, assisting with monitoring in Mexico, protecting and managing known habitat, and continuing research efforts to provide a better understanding of the subspecies (FWS 1994). The NPS will assist in Sonoran pronghorn recovery by continuing to serve as a member of the interagency Core Working Group. As called for in the monument's Natural and Cultural Resources Management Plan (NPS 1994), the NPS will implement activities outlined in the recovery plan, under the lead of the FWS, including development of a monitoring program. Furthermore, to reduce the potential for adverse impacts on pronghorn resulting from increased visitor use in front- and backcountry areas of the monument, the NPS would monitor visitor use and restrict access where necessary to minimize the potential for disturbance to pronghorn.

Determination of Effect

Since there would be no substantive changes to traffic levels or patterns along State Route 85, existing and future road conditions would continue to act as a barrier, restricting pronghorn movements to areas west of the highway. Such actions may adversely affect Sonoran pronghorn if it leads to a reduction in genetic exchange and reduced viability, potentially eliminating populations from this portion of their range.

However, to help reduce the impact of State Route 85 on pronghorn, the NPS proposes to:

pursue an agreement between the NPS and ADOT to (1) establish a vehicle for continued communication regarding road-related issues; (2) construct underpasses at known movement corridors to facilitate safe passage of pronghorn across the highway; and (3) establish a program to explore other measures to better understand and subsequently reduce the impacts of State Route 85 on pronghorn
continue working with the Arizona Department of Public Safety to enforce the existing speed limit within the monument

convert the top and bottom strands of the monument's north and south boundary fences to smooth wire to encourage pronghorn movements between the monument and Cabeza Prieta National Wildlife Refuge to the north, and Mexico to the south

educate motorists about the plight of pronghorn using a variety of interpretive media in an effort to elicit lower speeds and increased awareness of wildlife use of the highway corridor

continue to serve as a member of the interagency Core Working Group for Sonoran pronghorn recovery and implement activities outlined in the recovery plan, including development of a monitoring program
monitor visitor use and restrict access where necessary to minimize the potential for disturbance to pronghorn

QUITOBAQUITO DESERT PUPFISH

The Quitobaquito desert pupfish, endemic to the spring outflows and pond at Quitobaquito, is the only fish known to occur within the monument. Anthropogenic impacts (e.g., water pollution, introduction of non-native fish) and stochastic events (e.g., environmental perturbations) pose a potential threat to the subspecies' survival. Since 1975, a monitoring program has been conducted annually to assess the population's status. Population estimates have ranged from a high of 7,294 individuals in 1975, to a low of 1,800 in 1981, with intervening years reporting a population size of 3,000-6,700 individuals. A census conducted in 1993 reported 2,305 and 4,299 fish in the pond during the spring and fall censuses, respectively. More recently, 6,644 pupfish were reported during a 1995 census.

Observations made during the biannual census indicate that the population is in good condition with a healthy distribution of age and size classes. No non-native fish were discovered in either the pond or channel. However, a 10-inch black bullhead (*Ictalurus melas*) was caught and removed from the southwest spring during a census for the Sonoran mud turtle (*Kinosternon sonoriense*) on August 1, 1993. (It is unknown whether this fish represents an isolated introduction or is part of a larger population released into the Quitobaquito system.) Trapping for non-native fish is ongoing and continues at approximately 10-week intervals.

Because population counts appear to typically underestimate the actual number of fish present, the monitoring protocol requires a review and possible modification to ensure validity and usefulness of the data. The monument's Natural and Cultural Resources Management Plan (NPS 1994) recognizes this deficiency and calls for the implementation of an expanded Quitobaquito desert pupfish monitoring program.

Proposed Actions That May Affect the Quitobaquito Desert Pupfish

To enhance visitor experience and resource protection, the GMP proposes several actions that would alter visitor use patterns in the Quitobaquito area. These actions focus on relocating visitor facilities and establishing day-use standards and user capacities to be developed as part of an inter-agency wilderness management plan.

A new parking lot would be placed in a previously disturbed area at the current intersection of Puerto Blanco Drive and the Quitobaquito road (refer to the site plan on page S-49 of the GMP Supplement). An orientation sign, interpretive information, a composting or vault toilet, and picnic tables shaded by a simple ramada, would be provided near the parking area. (Moving the parking lot and other facilities is expected to decrease the incidence of vehicle break-ins and theft in the area.)

A well-defined trail network would be established along existing roads and disturbed areas. This relatively easy, approximately one-mile loop trail would be made accessible to visitors with disabilities. The new trail would begin at the proposed parking area and travel along what is now the road. Approximately 0.5-mile down the trail, a new trail segment would be added that leads to the springs and on to the historic pond. A small portion of the trail network would be established near the pond to offer views of the pond and good birding opportunities. From the pond, the trail would loop back along the former parking lot and road, returning to the trailhead.

Once funding is secured, a multi-agency task force would be established to determine the exact location of proposed facilities and trails, and to develop detailed design drawings for the site. At a minimum, the task force would include representatives of the Tohono O'odham Nation, the FWS, the State Historic Preservation Office, and the NPS. Team members would represent various disciplines including archeology, anthropology, landscape architecture, and wildlife biology.

Analysis

Establishment of a well-designed and maintained trail system would have a long-term beneficial affect on the Quitobaquito desert pupfish and its designated critical habitat. By encouraging visitors to remain on established trails, there would be a reduction and possibly an elimination of vegetation trampling along the pond's littoral zone. This highly productive zone, dominated by stands of bulrush and submerged aquatic vegetation, is rich in invertebrates and provides protective cover, along with important foraging, spawning, and resting areas for desert pupfish.

To further minimize the potential for impacts on the pupfish population or its critical habitat, visitor use would be closely regulated through development of a visitor carrying capacity for the area. Although the pupfish population would remain vulnerable to stochastic events, visitor use restrictions would help reduce the risk from anthropogenic impacts.

The NPS would continue to aid pupfish recovery efforts by implementing actions contained in the desert pupfish recovery plan (FWS 1993b). Some of the specific actions to be accomplished include an expansion of the current monitoring program to assess population status, detect trends, and evaluate the success of pupfish recovery. The NPS would continue to conduct habitat assessments and population estimates under site-specific protocols mutually established by the NPS and FWS, and assist with the collection of life history information to help determine factors affecting population persistence. In addition, the NPS would further its efforts to educate the public about the plight of the Quitobaquito desert pupfish through a variety of interpretive media (e.g., wayside exhibits, brochures, guided walks). The NPS would work closely with the FWS on the above actions.

Reasonable and Prudent Measures Proposed

The NPS would continue to monitor the effects of visitor use on desert pupfish habitat. Use of the Quitobaquito area would be closely regulated through establishment of a visitor carrying capacity which would be based primarily on the area's ability to withstand visitor use while ensuring resource protection. Activities determined to have an adverse impact on pupfish habitat would be further restricted or possibly eliminated.

Determination of Effect

Establishment of a well-defined and maintained trail system, as well as visitor use restrictions would have a beneficial affect on the Quitobaquito desert pupfish and its critical habitat by minimizing vegetation trampling along the pond's littoral zone. By restricting visitor access in the Quitobaquito area, the risk from anthropogenic impacts also would be reduced. The NPS would continue to aid pupfish recovery efforts by implementing actions contained in the desert pupfish recovery plan.

CACTUS FERRUGINOUS PYGMY-OWL

The cactus ferruginous pygmy-owl is an uncommon permanent resident that occurs in washes and saguaro stands. The most recent verified sighting of a pygmy-owl within the monument has occurred this spring in the employee housing area at Twin Peaks. Prior to this sighting, the last recorded observation was in 1995 on the Ajo Mountains bajada (T. Tibbitts, pers. comm.). The cause for the ferruginous pygmy-owl's decline within the monument and throughout the northern part of its range is unknown. However, the ongoing destruction of riparian habitat across the region may partially explain the reasons behind the decline.

Critical habitat for the cactus ferruginous pygmy-owl has been proposed from the well in Alamo Canyon (T16S, R4W, unsurveyed Section 6) downstream to the point where Growler Wash intersects the Bates Well Road. The boundaries encompass the current active channel, in addition to secondary, side, and overflow channels extending up to 100 meters laterally of the 100-year floodplain. Despite nearly annual

reports, a confirmed sighting of this owl has not occurred in the vicinity of the Alamo Canyon campground for nearly 10 years. However, the nearby wash has been proposed as critical habitat since it possesses suitable habitat characteristics and has the potential to support nesting owls.

Proposed Actions That May Affect the Cactus Ferruginous Pygmy-Owl

Three actions proposed in the GMP have the potential to increase visitor use or alter vegetation in the Alamo Canyon area which could affect the cactus ferruginous pygmy-owl or its proposed critical habitat. These actions are the same as those described for the lesser long-nosed bat and include:

- expanding the campground by four sites
- establishing a formal day-use parking area
- formalizing an existing social trail (an old road scar) into a designated trail

Visitor surveys and demand for camping at the Alamo Canyon Wash campground show increasing interest in a primitive camping experience, accessible by vehicle. During the heavy use period (late October through mid-April), this campground is almost always full. The existing campground currently contains four campsites, a composting/vault toilet, and a large parking area. Each campsite has a maximum user capacity of four persons per site, for a total campground capacity of 20 campers. To help accommodate visitor demand, the GMP proposes to expand this campground. A cluster of four campsites would be added, each containing a parking space (approximately 12' x 22'), picnic table (standard 6' in length), and cleared area for a tent (approximately 20' x 20'). No water would be provided. Depending on the distance to the existing campground, one composting or portable vault toilet would be installed in the area of the new campsites. The sites would be located within the non-wilderness road corridor (150 feet from either side of road centerline), in previously disturbed areas, to the extent possible, and somewhat separated from other sites to offer a sense of privacy. Approximately 0.1 acre of vegetation could be impacted by campground expansion.

Currently, a compacted area (roughly 3,500 square feet in size), encircled by large rocks, is located at the end of the access road and serves as a day-use parking and vehicle turn-around area. The GMP proposes to better delineate this parking area while restricting ground disturbance to the roadbed. To further manage visitor use, the existing social trail that follows an old road scar along the wash would be formalized into a designated hiking trail, about 2.25 miles in length. Because the parking area and trail would be constructed on previously disturbed ground, there would be no additional vegetation removed.

Analysis

Surveys for the cactus ferruginous pygmy-owl have been performed by NPS personnel in the Alamo Canyon area for the last two years. Surveys have been conducted approximately 12 times per year from December through June, with negative results.

Expansion of the Alamo Canyon campground would occur within proposed critical habitat for the cactus ferruginous pygmy-owl, eliminating less than 0.1 acre of desert scrub vegetation, primarily triangle-leaf bursage (*Ambrosia deltoidea*) and creosote (*Larrea tridentata*). Wherever possible, campsites would be situated to avoid the removal of large trees, shrubs, and columnar cacti. The proposed parking area would not involve new ground disturbance or vegetation removal since it would be located entirely within the existing roadbed. Similarly, the establishment of a formal hiking trail along Alamo Canyon wash would not result in additional habitat losses since the new trail would incorporate an existing social trail over its entire length.

Although day use in the Alamo Canyon area is typically limited to hikes along the wash, which is also within proposed critical habitat for the cactus ferruginous pygmy-owl, this type of visitor use is generally infrequent, occurs at low-levels, and is confined to the existing trail. Likewise, the current low-levels of overnight use do not appear to have an adverse impact on this species. However, the affect that doubling the size of the campground would have is unknown. Since campground expansion could result

in the presence of twice as many campers (a maximum of 40 vs 20 campers currently) in the area at dawn and dusk, periods when this owl is actively foraging, the potential for human disturbance would be greater than under existing conditions.

Reasonable and Prudent Measures Proposed

To ensure that campground expansion and increased visitor use of the Alamo Canyon area does not result in adverse effects on the cactus ferruginous pygmy-owl, the NPS would continue to conduct owl surveys at this location. If subsequent surveys reveal the presence of pygmy-owls, the NPS would reconsider the appropriateness of campground expansion as well as the need for visitor use restrictions in the Alamo Canyon area.

Determination of Effect

Proposed actions in the Alamo Canyon area would have no effect on the cactus ferruginous pygmy-owl due to the lack of this owl's confirmed presence in the area, the low potential for human disturbance, and negligible habitat losses.

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Appendix B. Impact Analysis for Existing Conditions (Alternative A) NPS Projects in Organ Pipe Cactus National Monument (Includes projects implemented or occurring 1997-2001)

Project Title	Project Description	Geographic Location	Impacts on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
Trespass livestock grazing,	Grazing of trespass 1937-current	Entire Monument	Loss and degradation of habitat due to livestock impacts; disturbance due to increased human activity; competition for forage and water; disease vectors. Possibly 50,000-200,000 acres affected.	Adverse	Long-term	Major	Regional
Illegal hunting	Poaching of Sonoran pronghorn	Potentially western OPCNM	Mortality. May take place on up to 200,000 acres, but this impact is believed to be very minor or absent at present.	Adverse	Long-term	Minor	Widespread
Illegal woodcutting	Intrusion of local U.S. and Mexico residents onto OPCNM to harvest wood; also near mines, ranches, roads, 1937-present	Mostly southern boundary area	Degradation of habitat; disturbance due to human activity. Area estimate difficult, probably thousands of acres	Adverse	Long-term	Moderate	Widespread
Removal fence between OPCNM and CPNWR	Removal fence between OPCNM and CPNWR 1990-1999	Western boundary	Removal of impediment to movement; reduced potential for mortality. Removed approx. 20 miles of fence.	Beneficial	Long-term	Major	Regional
Installation of soil moisture/temp probes.	Soil moisture/temperature probes were installed at 11 climate stations distributed around ORPI. 1997	Various	Some disturbance impacts possible. Several stations (Aguajita, Pozo Nuevo, Growler Valley, East Armenta) are in pronghorn habitat. Installation and maintenance/servicing introduces human presence in pronghorn habitat, also small permanent structures in habitat. Approx 0.1 ac total	Adverse	Long-term	Minor	Localized
Veg removal for preserving historical structures	Vegetation was trimmed around historical structures, to facilitate public experience and prevent possible damage. 1998	Bates Well, Bonita Well	Adverse disturbance impacts, in that the clearing facilitated and was part of increased visitation in pronghorn areas, e.g. organized interpretive programs at Bates Well and Bonita Well. Approx 0.1 ac	Adverse	Short-term	Minor	Localized
North boundary fence- bottom wire replacement	Bottom strand of barbed wire was replaced with smooth wire set at 18", for most of distance 1998-1999	North Boundary from Hwy 85 west to 3-way corner of CPNWR/BLM/ORPI	Beneficial impacts. Modification should increase ability of pronghorn to pass underneath ORPI's north boundary fence, giving them access to additional range on BLM lands to the north. Approx 9 miles of fence modified.	Beneficial	Long-term	Moderate	Regional
Remodel visitor center restrooms (including leach field) OPCNM	New visitor center restrooms were constructed adjacent to the existing VC, and a new including leach field installed 1998-2000	Twin Peaks area	Incremental increase in VC/HQ developed area (habitat loss & disturbance); total disturbance of visitor center and restrooms. approx. 9 acres.	Adverse	Long-term	Minor	Localized
Parking areas- amphitheater & Victoria Mine	Two new parking areas, for 6-8 cars each, both at outer loop of main campground. 1998-2000	Twin Peaks area	Incremental increase in VC/HQ developed area (habitat loss & disturbance); Trailhead promotes additional use of Victoria Mine trail, facilitating increased human presence in backcountry pronghorn habitat. Approx 0.1 ac	Adverse	Long-term	Minor	Localized
Chlorination lines to main water tank	Campground and residence area lines. 1998-2000	Twin Peaks area	Approx. 16 acre incremental increase in VC/HQ developed area (habitat loss & disturbance). No restoration/mitigation	Adverse	Long-term	Minor	Localized
Alamo Canyon trailhead parking	Enlargement of parking area at Alamo Primitive Campground, Ajo Mts, to accommodate approx 4 additional vehicles. 1999	Alamo Canyon	Impacts negligible. Project would facilitate increased human use of backcountry area, but the site is in heavily vegetated upper-bajada habitat east of Hwy85. Probably rarely used by pronghorn even historically. Approx 0.1 ac	Adverse	Long-term	Negligible	Localized
Trail head parking, Old Sonoyta Road	Creation of a new trailhead with vehicle parking and self-service fee station, 2000	on Alamo Road just off Hwy85.	Disturbance impacts possible: introduces/promotes human presence in pronghorn habitat. Although this trail is just east of (and parallel to) Hwy85, increased promotion of this trail may reinforce barrier effect of Hwy85 corridor. Trailhead may also be used for hikers to	Adverse	Long-term	Minor	Localized

Project Title	Project Description	Geographic Location	Impacts on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
			go west of Hwy85, into nearby pronghorn high-use area. (Mile 66 Hill aka Eagle Pass) Approx 0.1 ac				
New route/trail segment: Red Tanks Tinaja to Milton Mine	A new trail constructed through the Puerto Blanco Mountains in southcentral ORPI. 1999	Puerto Blanco Mountains in southcentral ORPI	Possible disturbance impacts. Developing this trail system is likely to increase human foot traffic in and around the Puerto Blanco Mountains, in areas known to be used by pronghorn. Trail length approx 4 miles.	Adverse	Long-term	Moderate	Regional
Victoria Mine rehab work- Phases 1 and 2	Rehabilitation/restoration work done to old store structure. 1999	Victoria Mine complex, Sonoyta Mts	Potential negligible disturbance impacts from workers and project activity in pronghorn habitat. Approx 0.1 ac	Adverse	Short-term	Negligible	Local
Self-serve fee stations	Self-serve fee stations 2000.	Located at entrance to Monument on Bates Well Road, entrance to Alamo Road, entrance to North Puerto Blanco Drive.	Potential negligible disturbance impacts from installation activities, and creating site where vehicles will pause and people may linger (primarily Bates Well Road only).	Adverse	Short-term	Negligible	Local
Trail head signs	Installation of signs at formerly primitive trailheads. 1999-2000	Old Ajo-Sonoita Rd (2), Dripping Springs, Senita Basin, Milton Mine, Alamo & Victoria Mine.	Possible disturbance impacts. Developing parts of this trail system is likely to increase human foot traffic in and around the Puerto Blanco Mountains, in areas known to be used by pronghorn.	Adverse	Long-term	Moderate	Regional
Convert campsites from RV/pullthru to tent sites	Convert campsites from RV/pullthru to tent sites 1999-2000	In outer loops of main campground.	Possible beneficial impacts by reducing developed presence (replacing RV camping with tent/car camping), thereby reducing disturbance exclusion area around campground slightly Approx 2 ac.	Beneficial	Long-term	Minor	Local
Residence 15 parking space	Residence 15 was converted to dorm space, resulting in need for increased parking space. 1999	Twin Peaks area	Incremental increase in VC/HQ developed area (habitat loss & disturbance); Approx 0.1 ac	Adverse	Long-term	Negligible	Localized
Interpretive programs at Bates Well and Bonita Well	interpretive programs and "cowboy coffee" refreshments were provided at Bates Well and Bonita Well.	Bates Well and Bonita Well.	Adverse impacts through disturbance, by promoting large groups of vehicles and visitors present at these two locations in key pronghorn habitat. Area estimate difficult; local disturbance, possibly hundreds of acres.	Adverse	Short-term	Minor	Localized
Permitted backcountry and wilderness use	Use of remote areas by backpackers	Entire Monument	Potential disturbance from humans entering remote backcountry habitat areas. Up to 200,000 ac in pronghorn habitat	Adverse	Short-term	Minor	Localized
Wildland fire	Natural and man-caused fires occur in the backcountry	Scattered small sites throughout OPCNM	Potential loss of habitat due to fire. Area estimate difficult, probably hundreds of acres.	Adverse	Long-term	Negligible	Localized
General LPOP-Type Counter Narcotics Operations	Listening Post - Observation Post surveillance for law enforcement purposes; personnel conduct surveillance in backcountry and frontcountry areas, using night-vision and other technologies.	Parkwide	Impacts depend on nature of "Listening Post-Observation Post" (LPOP) activities, and effectiveness at reducing illicit traffic through pronghorn habitat. Potential adverse disturbance impacts due to project activities, also potential beneficial disturbance-reducing impacts if project reduces illicit activities. Area estimate difficult; parkwide.	Adverse And Beneficial	Short-term	Moderate	Localized
Sensor placement	Placement of seismic, motion-sensitive, and other sensors along roads, trails, washes for law enforcement surveillance purposes.	Parkwide	Potential beneficial impacts if effective at reducing illicit traffic through pronghorn habitat. Area estimate difficult.	Beneficial	Short-term	Moderate	Regional

Project Title	Project Description	Geographic Location	Impacts on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
LE Training	Law enforcement training in interdiction of drugs and undocumented aliens (UDAs)	Parkwide	Impacts depend on nature of activities, and effectiveness at reducing illicit traffic through pronghorn habitat. Potential adverse disturbance impacts due to project activities, also potential beneficial disturbance –reducing impacts if project reduces illicit activities. Area estimate difficult; parkwide.	Adverse And Beneficial	Short-term	Moderate	Localized
Coop Agreements/Activities with other Law Enforcement agencies	Facilitating interdiction operations for smuggling UDAs and drugs.	Parkwide	Impacts depend on nature of activities, and effectiveness at reducing illicit traffic through pronghorn habitat. Potential adverse disturbance impacts due to project activities, also potential beneficial disturbance –reducing impacts if project reduces illicit activities. Area estimate difficult; parkwide.	Adverse And Beneficial	Short-term	Moderate	Localized
Use of Armenta Road for Patrol and Management Purposes	Armenta/North Boundary Road closed to public use, but used frequently by NPS, BP, smugglers. This road connects Highway 85 to Bates Well Road, traversing Valley of the Ajo.	North-central boundary area	Adverse disturbance impacts possible. This road allows human presence to persist across the north end of the Valley of the Ajo. Pronghorn use this valley year-round, and especially in summer. Beneficial habitat protection impacts also possible as this road also allows access to maintain north boundary fence intensively, keeping domestic livestock out of important pronghorn habitat. Road is approx. 154 ac, 9 miles in length; approx. 22 acres.	Adverse	Long-term	Moderate	Localized
Emergency Operations	Search and rescue, emergency medical response, emergency traffic control, fire response (wildland and structural), etc.	Parkwide	Impacts depend on nature, scale and location of activities; use of helicopters, other backcountry activities, etc. Potential adverse disturbance from activities. Area estimate difficult; parkwide.	Adverse	Short-term	Moderate	Localized
Pruning and/or removing vegetation along all public drives.	Pruning and/or removal of trees on public drives to prevent vehicle damage, open up sight vistas, improve line-of-sight, etc.	Parkwide, on roads.	Project may facilitate faster vehicle travel, which may in turn increase noise disturbance and risk of pronghorn roadkill. Vegetation management may also alter pronghorn habitat. Potentially along up to ≈94 miles of roads	Adverse	Long-term	Minor	Localized
Dirt road maintenance	Routine grading maintenance of Ajo Mountain Drive, Puerto Blanco Drive, Armenta Road, Bates Well Road.	Parkwide, on dirt roads.	Adverse disturbance and habitat impacts; road maintenance facilitates increased human presence. If grading incrementally widens or otherwise "improves" roads, impacts could be more severe, e.g. if grading amounted to widening which in combination with tree trimming facilitated faster vehicle speeds, greater volume, incremental trend toward paved drives, etc. Also, noise of road grader would cause disturbance. Involves ≈ 87-110 miles of roads (21-30 east of Hwy85)	Adverse	Long-term	Minor	Regional
Borrow pit use	Sites where sand and gravel were and are removed for construction purposes.	Various locations, central corridor, Armenta Road, South Puerto Blanco	If borrow pits are in pronghorn habitat, disturbance and/or habitat degradation are possible. Area estimate difficult; several acres?	Adverse	Short-term	Minor	Localized

Project Title	Project Description	Geographic Location	Impacts on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
Wildlife Surveys and Ecological Monitoring in Wilderness areas	Ecological Monitoring Program data collection carried out at up to 14 sites annually. Includes: nocturnal rodent trapping grids; lizard transects; vegetation sampling; avian monitoring; climate stations and rain gages; sampling bats at tinajas; snake monitoring. Sites in often-used pronghorn habitat include: Pozo Nuevo, Aguajita Wash, Growler Valley, Bates Well area, Valley of the Ajo.	Parkwide	Potential impacts both adverse and beneficial. Presence of humans engaged in data collection may be disturbance factor, however data collection may lead to improved management. Area estimate difficult; parkwide.	Adverse And Beneficial	Short-term Long-term	Minor Moderate	Localized Widespread
Threatened and Endangered Species research and monitoring	Monitoring Sonoran pronghorn, Quitobaquito pupfish, lesser long-nosed bat, cactus ferruginous pygmy-owl, acuna cactus.	Parkwide	Adverse and beneficial, impacts. Capture/collaring of Sonoran pronghorn have been harmful, resulting in direct mortalities of pronghorn. Conversely, radiotelemetry yields information valuable in managing pronghorn. Monitoring Quitobaquito pupfish takes place only at Quitobaquito where pronghorn do not go; monitoring lesser long-nosed bat takes place east of Hwy85 where pronghorn no longer range; monitoring cactus ferruginous pygmy-owls occasionally takes place in two areas where pronghorn occasionally range. However, owl monitoring in these places takes place unobtrusively, and only about 8-10 mornings per year. Area estimate difficult; parkwide.	Adverse And Beneficial	Short-term Long-term	Minor Moderate	Localized Widespread
Brush pile burning	Scrap lumber and waste from tree pruning are stockpiled just off Highway 85 near Milepost 78, periodically burned in fire training.	Along Hwy85 approx. 2 mile south of VC	Impacts likely insignificant, unless fire escapes and becomes wildfire, which would alter habitat.	Adverse	Short-term	Negligible	Localized
Trail maintenance-vegetation trimming	Vegetation was trimmed along hiking trails. 1996-2000	Visitor's Center area, Campground, Victoria Mine trail	Maintains footprint of foot trails and human access into pronghorn habitat; possible disturbance. Approx 3.5 mi of trails.	Adverse	Short-term	Negligible	Localized
Backfill abandoned mines	Backfilling abandoned mine features - mostly 1m-3m deep prospect holes - to prevent pitfalls deaths of wildlife. If present, barbed-wire fences were removed. 1998-2001	Various backcountry areas	Beneficial impacts: reduces chance of injury/death. Although all mines backfilled to date have been east of Hwy85, others to west are next. Backfilling reduces potential for tripping/pitfall injuries. One previously undocumented mine in Bates Mts was fenced, reducing pitfall hazard - pronghorn was seen running past mineshaft opening. Approx. 30 to be filled	Beneficial	Long-term	Minor	Localized
Renovate residences to offices	To provide needed office space, 3 residences have been or are in the process of being converted into office space. one conversion completed 1995, another nearly complete (2001)	Twin Peaks development area (VC, HQ, Campground, Residences)	Adverse impacts due to small habitat loss (increased areas cleared for parking) and slight increase in human activity levels. Historically Sonoran pronghorn may have ranged in area (primarily in summer); now they are unlikely to be in area due to development. Approx. 0.25 ac.	Adverse	Long-term	Negligible	Localized
Highway 85 road shoulder maintenance	Trimming vegetation and blading clear zone on road shoulders.	Highway 85 corridor	Adverse impacts possible in the form of potentially increasing the movement barrier that Hwy 85 constitutes, by increasing roadway footprint and facilitating higher traffic speeds. 22 miles of roadway	Adverse	Long-term	Major	Regional

Project Title	Project Description	Geographic Location	Impacts on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
Highway 85 speed limit	Current NPS policy is 55mph speed limit, GMP was premised on 55mph. ADOT signed Hwy85 as 65mph in 1997 (Actual increase in 85 th percentile traffic speed was from 68 mph with 55 mph posted to 71 mph. With 65 mph posted). De facto speed limit continues as 65mph.	Highway 85 corridor	Adverse impacts effects in the form of potentially increasing the movement barrier that Hwy 85 constitutes, by increasing roadway footprint and facilitating higher traffic speeds. Increasing speed also increases roadkill possibilities. Increasing speeds may create demand for increasing road width, shoulder width, etc. which increases Hwy "footprint," therefore again increasing barrier effect. 22 miles of roadway, excludes pronghorn from approx. 90,000 acres of habitat.	Adverse	Long-term	Major	Regional
Jersey barrier wall in Cipriano Pass	A line of concrete jersey barriers were placed c1999 in Cipriano Pass in an attempt to close the Pozo Nuevo Road, which was being heavily used and damaged by smugglers.	Backcountry: Cipriano Hills	Impacts: Disturbance and habitat degradation. The wall caused illicit traffic to establish multiple new cross-country roads through pronghorn habitat in ORPI and CPNWR. Also, illicit traffic drove around the wall in local area, causing habitat impacts. Reduced amount of illicit traffic	Adverse Beneficial	Long-term Short-term	Major Minor	Regional Localized
Buffelgrass control	Nonnative grass is being manually removed throughout ORPI, especially along south boundary. 1995-present	Backcountry throughout ORPI	Beneficial impact: prevention of type conversion from Sonoran desertscrub to monotypic tallgrass association. Approx. 16,000 acres to date	Beneficial	Long-term	Major	Regional
Trenching and widening of South Puerto Blanco Drive	Trenches were excavated in 2001 along South Puerto Blanco Drive to discourage smugglers and UDAs from leaving the roadway and driving cross-country through ORPI to evade Border Patrol.	South Boundary west of Lukeville	Impacts are possibly both adverse and beneficial. Original trenching and continuing maintenance may cause disturbance, by operating heavy machinery in pronghorn habitat. If trenching successfully prevents off-road driving through pronghorn habitat, beneficial impacts by reducing disturbance and habitat degradation. If trenching causes illicit traffic to relocate elsewhere (e.g. to west in areas more heavily used by pronghorn), adverse impacts through disturbance and habitat degradation. Approx. 3 miles	Adverse And Beneficial	Short-term	Moderate	Regional
Placement of barrier in Red Tanks Wash	Jersey barriers were placed in Red Tanks Wash spring 2001 to control cross-country smuggling/UDA traffic, which used this route to access the North Puerto Blanco Drive.	Puerto Blanco Mts south of Red Tanks Tinaja	Possibly both adverse (disturbance & habitat impacts) and beneficial. (reduction of disturbance & habitat impacts). If barrier successfully prevented off-road driving through pronghorn habitat, beneficial effects by reducing disturbance and habitat degradation. If barriers caused illicit traffic to relocate elsewhere (e.g. to west in areas more heavily used by pronghorn), or drive around it in local area, adverse effects through disturbance and habitat degradation. Approx. 0.25 ac	Adverse And Beneficial	Short-term And Long-term	Minor to Moderate	Localized
Installation of gates on South Puerto Blanco Drive and elsewhere	Iron gates have been installed along South Puerto Blanco Drive and elsewhere to allow closure of roads and control traffic by smugglers and UDAs. Spring 2001	South Boundary west of Lukeville	Impacts are possibly both adverse (disturbance & habitat impacts) and beneficial. If gates successfully prevent off-road driving through pronghorn habitat, beneficial effects by reducing disturbance and habitat degradation. If gates cause illicit traffic to relocate elsewhere (e.g. to west in areas more heavily used by pronghorn), adverse effects through disturbance and habitat degradation. Area estimate difficult; up to several hundred acres impacted/saved depending on success.	Adverse And Beneficial	Short-term	Moderate	Regional
Baker Mine-Milton Mine trail	Creating, signing, promoting, and vegetation clearing for 1.2-mile Baker Mine-Milton Mine trail, in Puerto Blanco Mts.	Backcountry: Puerto Blanco Mts	Possible disturbance impacts. Developing this trail system is likely to increase human foot traffic in and around the Puerto Blanco Mountains, in areas known to be used by pronghorn. 1.2 miles	Adverse	Long-term	Moderate	Regional

Project Title	Project Description	Geographic Location	Impacts on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
Trespass Livestock Mgmt	Trespass livestock are controlled by continuous inspection of boundary fences. Most trespass is from BLM lands to north. Trespass cattle are typically relocated to BLM land by owner after notification by ORPI staff.	Generally on north boundary	Beneficial impacts through preventing (limiting) habitat degradation, competition, and potential transfer of disease. North and south boundary fences are maintained, and trespass livestock are herded out or removed by owners. Area estimate difficult; approx. several hundred acres.	Beneficial	Short-term	Major	Regional

**Appendix C. Impact Analysis for Past, Present, and Foreseeable Projects in the Action Area
(Actions of the NPS and Other State, Federal, County, Municipal Agencies and Private Entities)**

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
Part 1. Past Actions on Organ Pipe Cactus National Monument							
Permitted and trespass livestock grazing	Pre-1900s to latter 1970s, continuing on BLM	Grazing (cattle, horses & burros) on OPCNM, CPNWR, BLM, BMGR	Loss and degradation of habitat due to livestock impacts; disturbance due to increased human activity; competition for forage and water; disease vectors. Approx. 2-3 million acres affected.	Adverse	Long-term	Major	Widespread
Ranch improvements	Pre-1900s to latter 1970s, continuing on BLM	Construction or installation of wells, dams, charcos, corrals, internal fences, line camps, water haul sites	Loss and degradation of habitat; disturbance due to increased human activity; increased availability of water.	Adverse	Long-term	Major	Widespread
First OPCNM headquarters	1940-1957	Twin Peaks development area ; Constructed first visitor contact station, residences, campground, access roads and other structures	Loss and degradation of habitat; disturbance due to increased human activity; established permanent human habitations and facilities; associated developments and human activity precluded pronghorn from using Twin Peaks area. Approx. 100 acres direct impact.	Adverse	Long-term	Moderate	Localized
Illegal hunting	1937 - ?	Poaching of Sonoran pronghorn	Mortality. Possibly took place on OPCNM, CPNWR, BMGR, BLM – up to 2 million acres	Adverse	Long-term	Major	Widespread
OPCNM Mission '66 headquarters & campground,	late 1950s to early 1960s	Twin Peaks area: Constructed visitor center, residences, new campground, maintenance yard, paved access roads and other structures;	Loss of habitat; disturbance due to increased human activity; increased VC/HQ developed area, and facilitated greater human activity levels in VC/HQ area and surrounding area, precluding pronghorn from using wider Twin Peaks area. Roughly 400 acres.	Adverse	Long-term	Moderate	Localized
Highway 85	1942-1943	Construction & paving Hwy85, Why-Lukeville	Created movement barrier, ultimately excluding pronghorn from all historical habitat east of Hwy85 in OPCNM (Sonoyta Plain, western bajadas of Ajo Mts) Approx. 811 acres direct impacts in OPCNM, excluded pronghorn from approximately 90,000 acres habitat east of Hwy85 in OPCNM. Highway itself disturbs approx. 138 acres.	Adverse	Long-term	Major	Regional
Construction & Improvement of internal dirt roads and scenic loops, OPCNM	1950s	Improved or constructed Puerto Blanco Drive, Ajo Mountain Drive, Alamo Canyon Road, boundary road east of Lukeville, Armenta Road, etc.	Loss and degradation of habitat; disturbance due to facilitating increased human activity. Ajo Loop ≈ 44 ac, Puerto Blanco Loop ≈ 104 ac, Armenta/North Boundary Road ≈ 23 acres, Camino de Dos Republicas/Southeast Boundary Rd ≈ 32 ac	Adverse	Long-term	Moderate	Widespread
Off-road vehicle use, OPCNM	1937-1978	NPS motorized patrols used wash beds as transportation corridors	Disturbance due to increased human activity in roadless areas; some habitat degradation. Area estimate difficult, probably hundreds of acres.	Adverse	Short-term	Moderate	Widespread
Mining, OPCNM	1937-1976	Small mines and prospects located throughout OPCNM	Disturbance due to human activity; degradation & loss of habitat; potential direct mortality due to pitfalls; potential direct mortality due to subsistence poaching. Area estimate difficult, probably >1000 ac	Adverse	Long-term	Moderate	Localized
Illegal woodcutting	1937-present	Intrusion of local U.S. and Mexico residents onto OPCNM to harvest wood; also near mines, ranches, roads.	Degradation of habitat; disturbance due to human activity. Area estimate difficult, probably thousands of acres	Adverse	Long-term	Moderate	Widespread

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
OPCNM perimeter fences	1940s to 1950s	Construction of boundary fences	Impediment to movements; occasional mortality Approx. 64 miles of fence	Adverse	Long-term	Major	Regional
Removal fence between OPCNM and CPNWR	c1990-1999	Removal fence between OPCNM and CPNWR	Removal of impediment to movement; reduced potential for mortality. Removed approx. 20 miles of fence.	Beneficial	Long-term	Major	Regional
Boundary Patrols, OPCNM	1940-1950s	Various agencies patrolled south boundary of OPCNM; including U.S. Army, Border Patrol, Customs, Bureau of Animal Industry	Disturbance due to intermittent human activity. Patrols along approx. 30 mile international boundary.	Adverse	Short-term	Minor	Localized
Human occupation outside NPS headquarters area	1937-1976.	Occupation of ranch headquarters, residences, line camps, e.g., Bates Well, Bonita Well, Quitobaquito, Pozo Nuevo	Disturbance due to concentrated human activity; degradation and loss of habitat; possible direct mortality due to subsistence poaching. Impact area difficult to estimate, possibly approx. 100 -200 acres	Adverse	Long-term	Major	Localized
Road closures, OPCNM	Late 1970s to early 1980s	Roads closed due Wildemess Act of 1978, then entry portals revegetated.	Reduced disturbance due to human activity; dramatically reduced human presence in backcountry areas; allowed habitat recovery to begin. Approx. 97 acres closed/under restoration	Beneficial	Long-term	Major	Regional
Construction of fence at Quitobaquito	Year of construction unknown	Barbed-wire fence was constructed around Quitobaquito springs and pond to exclude cattle.	Exclusion from water source: habitat impacts due to cattle use increasing at other water sources. Fenced area approximately 5 ac.	Adverse	Long-term	Moderate	Regional
Removal of fence at Quitobaquito	1980	Barbed-wire fence was removed	Restored potential access to water source. 5ac	Beneficial	Long-term	Moderate	Regional
Removal of residents at Cipriano (Juan) Well and Quitobaquito	1950s-1960s	Hia Ced O'odham residents were removed from these sites and residences removed	Potential for disturbance reduced by removing concentrated human activity; allowed recovery of habitat to begin. Approx. 20 ac	Beneficial	Long-term	Moderate	Regional
Parking lot at Quitobaquito	1980s	Former parking area near the pond was removed and another was constructed to the east and closer to the international boundary.	Former parking area continues to naturally revegetate & may become habitat with higher resource value to pronghorn. Approx. 0.5 ac	Beneficial	Long-term	Minor	Localized
Supplemental wildlife waters, OPCNM	1976-c1982	NPS hauled water to former livestock water sites to provide water for wildlife, Blankenship, Bonita Well, Bates Well	Supplemental water may have enhanced pronghorn fitness and survival, but may also have served to enhance and localize predator populations. Area estimate difficult, probably tens of acres.	Beneficial And Adverse	Short-term	Minor and Minor	Localized
Purchase of Dowling Ranch, OPCNM	1970s	Dowling Ranch purchased in the from Al Gay (Gringo Pass Inc)	Secured NPS ownership/protection for 160 acre habitat area near Lukeville, preserving as potential habitat	Beneficial	Long-term	Minor	Localized
Management of Accelerated Erosion, OPCNM	1940s - 1950s and 1980s	Erosion control structures built in Growler Valley, Valley of the Ajo, Dos Lomitas, Armenta Ranch	Efforts may have prevented long-term habitat degradation, but also resulted in short-term degradation from ground disturbance, activity of heavy machinery; also short-term disturbance from heavy machinery.	Adverse	Long-term	Minor	Localized
Mistletoe control program, OPCNM	1950s	Mistletoe treated with 2,4,5-D in Cherioni Wash & other sites	Effects on other plants, and more widespread effects unknown. Possible adverse toxic impacts on pronghorn due to exposure to herbicide compounds; possible adverse impacts by reducing vegetation and thermal cover.	Adverse	Short-term	Minor	Localized

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
Campground for Volunteers-In-Parks, OPCNM	1983-1984	Constructed campground with 10 RV sites & large turnaround area, located in Residence area.	Incremental loss of habitat in already-developed area; incremental increase in disturbance due to human activity. Approx. 1ac	Adverse	Long-term	Minor	Localized
Quitobaquito water transport system	1989	New gunnite channel was built to conduct water 700' from springs to pond.	May have increased availability of water to pronghorn. Approx 1 ac.	Beneficial	Long-term	Minor	Localized
Lukeville land exchange, OPCNM	1989-1990.	Exchanged land w/ Gringo Pass Inc., for net gain of acres for ORPI, adjacent to Lukeville	Potential beneficial impacts by preserving acreage adjacent to Lukeville, although area unlikely to be used due to human activity	Beneficial	Long-term	Minor	Localized
Meteorological tower installation, OPCNM	Project completed 1990, tower removed 2000	USGS built approx. 80' guyed tower w/ meteorological instruments near Ajo Mountains,	Possible slightly adverse impacts due to disturbance during construction, although pronghorn have not occurred in area since 1970s. Approx. 0.1 ac	Adverse	Short-term	Negligible	Localized
Rehabilitate Ajo Mt Loop Drive, OPCNM	1991-1992	Several hills, and wash crossing sections were paved; disturbed areas were revegetated.	Possible adverse impacts (disturbance and movement barriers). Historically Sonoran pronghorn ranged in area (primarily in summer), but have not been confirmed in area recently. Approx. 2 mile or less actually paved	Adverse	Long-term	Minor	Localized
Construction of new fire station, OPCNM	1994-1995	New fire station constructed at maintenance yard.	Incremental increase in VC/HQ developed area (habitat loss and disturbance); historically Sonoran pronghorn may have ranged in area (primarily in summer); now they are unlikely to be in area due to development. Approx. 0.25 ac	Adverse	Long-term	Minor	Localized
Install new sewer distribution box behind Visitor's Center, OPCNM	1994-1995	Install new sewer distribution box behind Visitor's Center	Facilitated maintaining VC/HQ developed area (habitat loss & disturbance); historically Sonoran pronghorn may have ranged in area (primarily in summer); now they are unlikely to be in area due to development. 1 ac.	Adverse	Long-term	Negligible	Localized
Construction of a compressor shed at maintenance shop, OPCNM	1994-1995	Construction of a compressor shed at maintenance shop	Incremental increase in VC/HQ developed area (habitat loss & disturbance); historically Sonoran pronghorn may have ranged in area (primarily in summer); now they are unlikely to be in area due to development.	Adverse	Long-term	Minor	Localized
Bury electric cable and other electrical work in campground area. OPCNM	1995-1996	Bury electric cable and other electrical work in campground area.	Beneficial reduction of disturbance by reducing visual profile of campground; adverse habitat impacts through ground disturbance.	Beneficial And Adverse	Long-term	Negligible	Localized
Maintenance shop extension, OPCNM	1995-1997	Maintenance shop extension	Incremental increase in VC/HQ developed area (habitat loss & disturbance); historically Sonoran pronghorn may have ranged in area (primarily in summer); now they are unlikely to be in area due to development. Approx. 0.1 ac	Adverse	Long-term	Negligible	Localized
Construct duplexes and landscape, OPCNM	1995-1996	Construct residential duplexes; one adjacent to main campground, the other in main residence loop.	Incremental increase in VC/HQ developed area (habitat loss & disturbance); historically Sonoran pronghorn may have ranged in area (primarily in summer); now they are unlikely to be in area due to development. Approx. 1 ac	Adverse	Long-term	Minor	Localized
Install modular building at VIP campground, OPCNM	1997	A prefabricated building was installed in the Volunteer's campground, to serve as a supplemental community/meeting facility.	Incremental increase in VC/HQ developed area (habitat loss & disturbance); Approx. 0.1 ac	Adverse	Long-term	Minor	Localized

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
Travelers' Information System Station, OPCNM	1996	Small automated radio broadcast station, built 0.75 mile west of Hwy 85 along the Armenta Road.	Possible disturbance impacts. The TIS is in pronghorn habitat. Installation and maintenance/servicing introduces human presence in pronghorn habitat, also small permanent structure in habitat. Approx. 100 square ft	Adverse	Long-term	Negligible	Localized
Construction of restroom at Bonita Well, OPCNM	1980s?	A vault toilet was installed at Bonita Well.	Possible disturbance impacts by contributing to incremental upgrading of Bonita Well to a more developed visitor destination. 110 square feet	Adverse	Long-term	Minor	Localized
Discontinuing water sources at backcountry wells e.g. Bates, Bonita, etc., OPCNM		Old wells and water troughs were allowed to deteriorate or were dismantled, to avoid maintaining water sources to encourage UDAs. Some like Bates Well were dismantled to eliminate refugium populations of Quitobaquito pupfish.	Possible adverse impacts, through removing potentially usable water sources. However, most of these water sources were in heavily vegetated and partly developed areas, so pronghorn tendency to use them is unknown. Area estimate difficult; approximately 8 water sources.	Adverse	Long-term	Negligible	Regional

Part 2. Past Actions in Action Area, by all State Federal, County, Municipal, or Other Agencies, and Private Entities

Dewatering of the Gila River and Agricultural Development	pre-1900s to present	Construction of dams along the Gila and Salt Rivers have impounded and diverted water to agricultural areas in the region. Dams include Ashurst-Hayden, Roosevelt, Gillespie, Wellton, Mohawk, Tacna, Waddell, Coolidge, and Painted Rock.	Adverse impacts on habitat (major loss and degradation of habitat; loss of access to water; loss of cover sites; introduction of weed plant species); adverse impacts by creating barriers to movement; increased disturbance due to presence of humans; surface noise disturbance; increased probability of mortality; increased probability of disease transmission; exposure to toxins; increase in predators. Approx 240 river-miles dewatered between Phoenix-Colorado River	Adverse	Long-term	Major	Range-wide
Historic Ranching and Small Mining Activities	pre-1900s to 1980s	Prospecting and small- and large-scale mining; permitted livestock grazing; trespass grazing of cattle, horses and burros	Adverse impacts on habitat (major loss and degradation of habitat; loss of access to water; loss of cover sites (woodcutting); introduction of weed plant species); disturbance due to presence of humans and livestock in pronghorn habitat; availability of artificial water sources; increased probability of mortality; competition for forage; reduced forage quantity and quality; barriers to movement (fences); increased probability of disease transmission; exclusion from habitat; diminished recruitment. Area estimate difficult; Approx 1.5 million ac.	Adverse	Long-term	Major	Range-wide
Copper Mine at Ajo	1910s-1985	Major commercial production of copper; open pit 390 acres, 1.5 miles across and 1,000 ft. deep. Tailings dam, slag dump and overburden dump cover several miles	Loss and degradation of habitat; disturbance (blasting, drilling & other loud noises); barrier to movement; increased presence of humans in pronghorn habitat (disturbance); exclusion from habitat; exposure to toxins; introduction & increase of weedy plant species. Approx 4000 ac.	Adverse	Long-term	Moderate	Regional

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
Transportation and Utility Corridors	Past and Ongoing	Unmaintained dirt roads from 1937 to present. Proposed roads include Sonoyta-Rocky Point Rd.	Barriers to movement; loss and degradation of habitat; presence of humans in pronghorn habitat (disturbance); surface noise disturbance; loss of cover sites; introduction of weed plant species (habitat degradation). Hundreds of miles of corridors have enclosed U.S. pronghorn population in restricted area, and prevented interchange with Mexican population.	Adverse	Long-term	Major	Range-wide
Boundary fences, CPNWR	1940s-1970s	Boundary fences constructed along International Boundary and east boundary of CPNWR.	Adverse impacts by creating movement barriers that excluded pronghorn from habitat; increased potential for mortality via fence entanglement; Potential beneficial impacts by reducing numbers of trespass livestock in habitat on CPNWR. Approx. 75 miles of fence.	Adverse And Beneficial	Long-term	Moderate	Regional
Predator Control	1940s-1970s?	Shooting and poisoning of predators, mostly on the eastern part of CPNWR	Unknown impacts on Sonoran pronghorn population (no data); possible beneficial impacts by reducing predation. May have taken place over thousands of acres.	Beneficial	Short-term	Negligible	Regional
Hickiwan Casino, Convenience Store, and RV Park	Recent Past	Convenience store, RV park, and casino built in 1998.	Adverse impact in the form of habitat loss and strengthening movement barriers, by incremental increase in the populated zone at the margins of current habitat. Approx 15 ac.	Adverse	Long-term	Minor	Localized
Kuakatch development	Recent Past	Increase in number of people and houses at this townsite	Adverse impact in the form of habitat loss and strengthening movement barriers, by incremental increase in the populated zone at the margins of current habitat. Approx 10 ac.	Adverse	Long-term	Minor	Localized
Military Training Routes	Past, present & future	Air force realigned and/or widened portions of 6 out of 7 military training routes.	Possible adverse impacts in the form of disturbance and behavior modification. Takes place over \approx 1 to 2 million ac	Adverse	Long-term	Moderate	Range-wide
Undocumented Migrant Traffic	Past, Present, and Future	Estimates of 1,000 UDA's per day through OPCNM alone.	Adverse impacts in the form of loss and degradation of habitat; presence of humans in pronghorn habitat (disturbance); surface noise disturbance; spread of weed plant species (habitat degradation); increased probability of mortality (possible poaching); diminished recruitment. Takes place over \approx 1 to 2 million ac	Adverse and Beneficial	Short-term to Long-term	Minor to Major	Range-wide
BLM Livestock Grazing Allotments	1934-Present	Five BLM grazing allotments (Camerson, Childs, Coyote Flat, Sentinel, Why) within the vicinity of the BMGR and the active distributions of the Sonoran pronghorn.	Adverse impacts in the form of Loss and degradation of habitat; presence of humans in pronghorn habitat (disturbance); surface noise disturbance; presence of livestock in pronghorn habitat (disturbance); loss of cover sites; introduction of weed plant species (habitat degradation); availability of artificial water sources; increased probability of mortality; competition for forage; reduced forage quantity or quality; barrier to movement (fences); increased probability of disease transmission; exclusion from habitat; diminished recruitment. Approx 90,000 ac west of Hwy85	Adverse	Long-term	Major	Regional

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
Recreation on the Ajo Block, BLM	Past and Ongoing	Mainly vehicle-based camping. OHV travel is increasing. Border patrol uses area for patrols. Wildcat dumping occurs.	Adverse impacts in the form of loss and degradation of habitat; presence of humans in pronghorn habitat (disturbance); surface noise disturbance; loss of cover sites; introduction of weed plant species (habitat degradation); increased probability of mortality; barrier to movement; exclusion from habitat; diminished recruitment; increase in predators (including domestic dogs). Approx 90,000 ac west of Hwy85	Adverse	Long-term		Regional
Permitted outdoor recreation on the BMGR	Past and Ongoing	Sightseeing, OHV travel, vehicle camping, backpacking, hiking, picnicking	Adverse impacts in the form of loss and degradation of habitat; presence of humans in pronghorn habitat (disturbance); surface noise disturbance; loss of cover sites; introduction of weed plant species (habitat degradation); increased probability of mortality; barrier to movement; exclusion from habitat; diminished recruitment). Takes place over ≈500,000? ac	Adverse	Long-term	Minor	Regional
ADOT maintenance activities	Past and Ongoing	Activities include use & development of staging areas & materials sources, pavement overlays, chip-sealing, culvert extensions, roadside vegetation management.	Loss and degradation of habitat; presence of humans; surface noise disturbance; introduction and spread of weed plant species. Generally involves approx. 80 miles of highway, Gila Bend-Lukeville.	Adverse	Long-term	Moderate	Localized
Regional Trend of Population Growth	Past, present and future	In 2000, Arizona ranked the second fastest growing state. Yuma, Maricopa, and Pima counties population increased by 40% from 1990-2000.	Loss and degradation of habitat; surface noise disturbance; barrier to movement; increased presence of humans in pronghorn habitat (disturbance); exclusion from habitat; increase in predators; introduction & increase of weedy plant species. See Narrative for population increases and locations.	Adverse	Long-term	Major	Widespread
Illegal Subsistence and Sport Hunting of Sonoran Pronghorn	pre-1900s to present	Unrestrained hunting during monument establishment. A few poaching cases reported from 1950-1971	Adverse impacts through direct mortality. May have taken place over ≈1 to 2 million ac	Adverse	Long-term	Major	Range-wide
AZ Game and Fish Dept Activities	Past, Current, and Ongoing	Issue hunting permits, enforce permit regs., work on pronghorn recovery programs, maintain 23 wildlife water catchments on BMGR, participate in habitat mgmt. Programs.	Impacts both adverse and beneficial; improved knowledge base; surface noise disturbance; presence of humans in pronghorn habitat; availability of artificial water sources (increase in predators); increased probability of disease transmission; mortality from radio-collaring activities. Take place over ≈2 million ac	Beneficial and Adverse	Various	Moderate	Range-wide
Cabeza Prieta National Wildlife Refuge Management	1937-Future	860,010 acres of Sonoran desert established for conservation of native wildlife and resources. Recreation opportunities include backpacking, hunting, camping, 4x4 driving, Mt. biking, etc. A Comprehensive Conservation Plan/EIS is currently underway with an anticipated completion date of 2003.	Beneficial and adverse impacts: Beneficial management policies & activities (present); restricted access (present); loss and degradation of habitat (past grazing); predator control (past); disturbance from permitted presence of humans in pronghorn habitat (recreation and mgmt); aerial noise disturbance; presence of livestock in pronghorn habitat (past); loss of cover sites (illegal woodcutting, past overgrazing); spread of weed plant species by visitors; availability of artificial water sources; increased probability of mortality (past military activities); increased probability of survivorship; competition with livestock for forage (past); barriers to movement (fences); increased probability of disease transmission (artificial water); poaching (past, mostly). Approx 850,000 ac.	Beneficial and Adverse	Various	Major And Minor	Regional

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
NAFTA Related Developments	Current and Ongoing	North American Free Trade Agreement of 1995. Resulting in increased commerce between Mexico and U.S.	Adverse impacts in the form of strengthening movement barriers, due to increased traffic volume and truck traffic on Highway 85 and Mexico Highway 2. Approx 80 miles of Highway 85, Approx 150 on Hwy2.	Adverse	Long-term	Major	Regional
Residential Development in the Vicinity of the BMGR Boundary	Current and Probable Future	Several residential development near Yuma, increasing development in Dome, Ligurta, Wilton, Roll Tacna, and Mohawk.	Incremental increase in populated zone; increased human activity; increased pressure to provide recreational access; possible increase in poaching; strengthening movement barriers on perimeter of pronghorn range. Area estimate difficult: thousands of acres?	Adverse	Long-term	Major	Regional
U.S. Border Patrol Activities	Current and Probable Future	Traditional operations include patrolling roads, off-road areas, dragging unimproved roads, aerial reconnaissance, inspecting vehicles at checkpoints.	Loss and degradation of habitat; presence of humans in pronghorn habitat (disturbance); surface noise disturbance; aerial noise disturbance; spread of weed plant species (habitat degradation); increased probability of mortality; diminished recruitment; improved knowledge base of pronghorn activities (past). Area estimate difficult: thousands of acres?	Adverse	Long-term	Major	Range-wide
BMGR Integrated Cultural Resources Management Plan	Current and Probable Future	Plan and programmatic agreement expected by 12/31/01. Included inventory of traditional cultural places, ethnographic study.	Presence of humans in pronghorn habitat (disturbance); surface noise disturbance.	Adverse	Short-term	Negligible	Localized
Changes in Land Use in Paloma Ranch Area of Gila Bend	Current and Ongoing	Approx. 100,000 acres of undeveloped and fallow agricultural land west of Gila Bend planned for future development.	Increase in surface noise disturbance; increase in human presence; loss & degradation of habitat; increase in predators; increased probability of disease transmission; barrier to movement. Area estimate difficult: thousands of acres?	Adverse	Long-term	Minor	Localized
Development of Fallow Agricultural Land in the Dateland Area	Current	Town of Dateland has encouraged development of fallow agricultural land no. and so. of Hwy. 8.	Continued loss of and exclusion from habitat; barrier to movement; surface noise disturbance. Area estimate difficult: thousands of acres?	Adverse	Long-term	Moderate	Regional
Low-level Military Overflights Over CPNWR	Past, present and future	Continuation of low-level overflights of fixed-wing aircraft on 2 flight corridors over CPNWR for up to 60 days per year.	Continuation of aerial noise disturbance. ≈850,000 ac	Adverse	Long-term	Minor	Regional
Ground Support Zones	Past, Present and Future	Consolidation of former ground support areas into fewer but larger ground support zones.	In these zones, continuation of surface noise disturbance; continued loss and degradation of habitat (reduced from previous); temporary exclusion from habitat. Area estimate difficult: thousands of acres?	Adverse	Long-term	Moderate	Regional
Add TACTS Range Threat Emitters	Past and Ongoing	Operate permanent small facilities that emit radar energy to simulate aerial combat scenarios for training purposes.	Exclusion from habitat; increased surface & aerial noise disturbance. Area estimate difficult: hundreds of acres?	Adverse	Long-term	Minor	Localized
Low-level Flight Corridors for Military Helicopters	Past and Probable Future	Low-level helicopter flights over core habitat; 11 flight corridors reduced to 3 corridors in YTRC FEIS.	Continuation of aerial noise disturbance; decrease in aerial noise disturbance. Area estimate difficult: thousands of acres?	Adverse	Long-term	Minor	Regional
Sonoran Pronghorn	Current and Ongoing	See Narrative	Sets beneficial management direction. Approx. 2 million ac range	Beneficial	Long-term	Major	Range-wide

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
Recovery Plan							
Sonoran Desert National Monument Establishment and Management	Current and Ongoing	496,337 acres of land in NE portion of BMGR proclamation by Clinton in 2001. Mgmt. Plans are underway.	Beneficial land use designation, but outside action area and current pronghorn range. Approx 500,000 ac.	Beneficial	Long-term	Major	Regional
Flat-tailed Horned Lizard Rangewide Management Strategy	Current and Ongoing	Rangewide mgmt. strategy calls for establishment of mgmt. areas - One in AZ. That includes BMGR west lands.	Sets management direction. Protects pronghorn habitat. Could force adverse actions into pronghorn habitat. Area estimate difficult: thousands of acres?	Beneficial	Long-term	Minor	Regional
Mohawk Mountains and Sand Dunes ACEC	Past and Ongoing	Continuation of special land-use designation.	Protection of pronghorn habitat.	Beneficial	Long-term	Major	Regional
Man and the Biosphere Program	Current and Ongoing	UNESCO recognition of the park's global and regional significance.	Beneficial land use designation. Relevant to ~330,000 ac at OPCNM	Beneficial	Long-term	Negligible	Range-wide
BMGR Land Withdrawal	Past and Ongoing	BMGR land withdrawal is reserved for (1) an armament and high hazard testing area; (2) training for aerial gunnery, rocketry, electronic warfare, and tactical maneuvering and air support; and (3) other defense related purposes. The restricted airspace associated with the BMGR is designated by the FAA to denote defined airspace areas where military activities such as aerial gunnery, artillery firing, or missile firings can occur.	Continuation of: loss and degradation of habitat; presence of humans in pronghorn habitat (disturbance); surface noise disturbance; aerial noise disturbance; loss of cover sites; introduction of weed plant species (habitat degradation); availability of artificial water sources; increased probability of mortality; barriers to movement; exclusion from habitat; exposure to toxins; diminished recruitment; restricted recreation access (beneficial).	Beneficial and Adverse	Long-term	Major and Minor	Regional
El Pinacate y El Gran Desierto de Altar	Current and Ongoing	South of Border in pronghorn range. Protected ecosystems include core area and buffer zone.	Benefits: beneficial land use designation; protection of resources; professional management; regulation of recreational use. Adverse: livestock grazing, mining, residential areas.	Beneficial and Adverse	Long-term	Major and Major	Regional
Lower Gila South Resource Management Plan (Goldwater Amendment)	1990-2001	1990 plan addresses non-military land use and natural and cultural resources.	Increased probability of mortality; surface noise disturbance; availability of artificial water sources; presence of humans in pronghorn habitat; beneficial land use designation.	Beneficial and Adverse		Regional	
Archaeology and Other Resource Management Activities	Ongoing	Ongoing archeological and resource study and monitoring activities.	Presence of humans in pronghorn habitat (disturbance); surface noise disturbance; improved knowledge base. Area estimate difficult.	Beneficial and Adverse	Short-term	Minor and Minor	Regional

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
Mitigation for Military Operations in Sonoran Pronghorn Habitat	Current and Probable Future	Daily air and vehicle patrols for presence of pronghorn. Every attempt is made to avoid disturbance.	Presence of humans in pronghorn habitat (disturbance); surface noise disturbance; improved knowledge base. Area estimate difficult.	Beneficial and Adverse		Moderate	
BLM Management Plan for other BMGR Parcels not renewed by the Military Lands Withdrawal Act of 1999	Current and Ongoing	Report to Congress in 2000 renewed the withdrawal of BMGR except for approx. 107,000 acres. BLM future mgmt. of withdrawn lands possible.	Impacts and acreages unknown, pending management plans.	Unknown	Unknown	Unknown	Unknown
Arizona State Parks Arizona Trails 2000 Plan	1999	Recommends actions to help guide off-hwy. and vehicle and nonmotorized trails programs through 2005.	Impacts and acreages unknown, pending management plans.	Unknown	Unknown	Unknown	Unknown
BLM Off-Highway Vehicle Policy	2001 to present	Guidance and recommendations for off-hwy vehicle mgmt.	Impacts and acreages unknown, pending management plans.	Unknown	Unknown	Unknown	Unknown
Discontinued low-level holding areas for military aircraft over CPNWR	Present & Ongoing	Discontinuation of low-level holding areas for fixed-wing military aircraft over pronghorn habitat	Beneficial impacts, by reducing potential disturbance and behavior alterations by decreasing aerial noise. Approx 850,000 acres	Beneficial	Long-term	Major	Regional
Lechuguilla-Mohawk Habitat Management Plan	1997-2001	Wildlife improvement projects on 930,000 acres of public land including BMGR-west and public lands to the north and west of BMGR-west.	Surface noise disturbance; increase in predators; presence of humans in pronghorn habitat; availability of artificial water sources; increased possibility of disease transmission.	Adverse And Beneficial	Short-And Long-term	Minor to Moderate	Regional
Reopening of Copper Mine at Ajo (Possible Future)	Possible Future	A workforce of 350-400 and approx. \$240 million in improvements are proposed if the mine reopens. Annual production is estimated at 135 million lbs. copper and 25,000 oz. of gold.	Increased loss and degradation of habitat; disturbance (blasting & other loud noises); barrier to movement; increased presence of humans in pronghorn habitat (disturbance); exclusion from habitat; possible exposure to airborne and runoff toxins.	Adverse	Long-term	Moderate	Regional
Cellular Telephone Tower construction along Highway 85	Possible Future	4 towers constructed along Hwy 85, between Ajo and Gila Bend	Incremental increase in utility/road corridor disturbance; loss of habitat; temporary increase in human presence and noise. Four towers in 39 miles of Hwy85.	Adverse	Long-term	Negligible	Localized
Gila Bend to Ajo 230kV Transmission Line	Possible Future	Approx. 47 miles long by 110 ft. wide from Gila Bend to Ajo. Currently, there are no plans to construct unless mine at Ajo resumes.	Incremental increase in utility/road corridor disturbance; movement barrier; loss of habitat; temporary increase in human presence and noise. 40-mile corridor.	Adverse	Long-term	Moderate To Major	Regional
Flash Burning of Military Munitions Residue	Ongoing	Burning of ignitable energetic materials to ensure safety within the recycling chain. Materials consist of munitions scrap from	Presence of humans in pronghorn habitat (disturbance); surface noise disturbance. Flash-burning is within footprint of currently-impacted target areas.	Adverse	Short-term	Minor	Localized

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
		practice bombs, rockets, etc.					
Clean-up of Inactive Air Force Targets	Probable Future	Cleanup at 17 inactive sites and 3 non-target sites. 11,514 acres subject to clearance	Presence of humans in pronghorn habitat (disturbance); surface noise disturbance. 11,514 acres.	Adverse	Short-term	Minor	Localized
Air Force "Target Town"/Mission Support Plan	Possible Future	Designed to resemble an urban area. It would consist of stacked shipping containers with exterior lighting. A "no drop" target used for target I.D. and siting.	Loss and degradation of habitat; increased probability of mortality; decrease in recruitment; presence of humans in pronghorn habitat (disturbance); surface noise disturbance; aerial noise disturbance. 250 acres or 1 km square	Adverse	Long-term	Major	Regional
Air Force Gravel Extraction	Probable Future	Excavation of sand and gravel from dry washes for use in road repairs and reconditioning of manned range strafe pits. Seven proposed sites. Acreage unknown.	Loss and degradation of habitat; presence of humans in pronghorn habitat; surface noise disturbance; aerial noise disturbance; spread of weedy plant species. Area estimate not available.	Adverse	Long-term	Moderate	Localized
Increasing Air Force Night Training Operations	Possible Future	All military airspace is being evaluated for an increase in night attack training operations. Guidelines on when and where have not occurred.	Aerial noise. Impacts of Night Operations included under "BMGR Land Withdrawal" Potentially approx. 1 million acres	Adverse	Long-term	Moderate	Regional
Transporting Boilers to Palo Verde Nuclear Generating Station	Probable Future	Summer 2002. Three nuclear generators will be transported in a 150 ft. self-propelled modular transporter travelling 4 mph. on Hwy. 85. Ten day travel time is expected.	Potential adverse disturbance impacts from human activity and surface noise. 80 miles of Hwy85	Adverse	Short-term	Negligible	Localized
Future Aircraft and Weapons Systems	Possible Future	Training with long range weapons at their full stand off range. Could require the closure of BMGR to public. No firm plans for this type of training.	Increase in probability of mortality & aerial noise (disturbance). Area estimate unavailable.	Adverse	Long-term	Moderate	Regional
Panda Power and Gila Bend Power Partners, LLC Power Plants	Probable Future	Two elec. power plants proposed in the vicinity of Gila Bend. Land is being purchased around the site of the plants for potential mixed use development.	Loss and degradation of habitat; surface noise disturbance. Area estimate unavailable.	Adverse	Long-term	Minor	Regional
National Guard Beddown of Apache Helicopters at WAATS	Future	Addition of 32-50 Apache helicopters for use in BMGR. An EA and FONSI is completed. Additions could begin in 2002.	Presence of humans in pronghorn habitat (disturbance); surface noise disturbance; aerial noise disturbance; increased probability of mortality. Area estimate unavailable	Adverse	Short-term	Moderate	Localized

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
Reduced 5-year EOD Clearance Requirements	Probable Future	EOD sweeps of manned ranges.	Impacts ongoing but reduced area affected. Impacts of EOD clearance included under "BMGR Land Withdrawal"	Beneficial	Short-term	Minor	Localized
Sonoran Pronghorn Forage Enhancement	Possible Future	Annual and perennial forage enhancement in 10 areas on BMGR, fall 2001.	Increase in forage; increase in predators; degradation of native habitat; increase in human activity. Approx 2470 acres.	Beneficial and Adverse	Short-term	Moderate And Minor	Localized
BMGR Integrated Natural Resources Management Plan	After 2001	Joint plan (Navy, AF, DOI) for the mgmt. of BMGR. EIS is initiated. Issues identified include protection of natural and cultural resources, mgmt, of brush fires, design of range gates for wildlife, and use of BMGR for hunting and trapping.	Setting management policies; beneficial land use zoning; improved knowledge base; presence of humans in pronghorn habitat (disturbance); surface noise disturbance.	Beneficial and Adverse	Long-term	Major and Minor	Regional
Citizen's Initiative: Sonoran Desert National Park	Possible Future	Proposal to consolidate multiple-agency management into one large national park.	Beneficial management strategies; professional management; regulation of recreation; increased human visitation. Approx 3 million acres	Beneficial and Adverse	Long-term	Major and Minor	Regional
Part 3. Future NPS Actions in Organ Pipe Cactus National Monument that are not included in the 1997 General Management Plan. (This list is comprised of potential projects; these projects may not be funded. Impacts would only accrue if projects were funded and carried out)							
South Puerto Blanco Drive Improvement	Possible Future	Reconstruct the South Puerto Blanco Drive. Widen to 18' (increase of approx 2') to meet NPS standard and eliminate safety hazard	Negative impact due to human presence and activities. Habitat loss approximately 3.2 acres	Adverse	Both short-term acute and long-term, chronic effects on pronghorn	Minor	Local, scattered
Fuel management, Quitobaquito	Possible Future	Project would reduce accumulated fuels that create a wildfire hazard at Quitobaquito Pond - mesquite, acacia, hackberry, etc. Dead and down plant material would be removed, and some live trees and shrubs removed.	Impacts depend on nature & scale of project. Project activities may be detrimental (local disturbance), and new configuration may have effects. Fuel reduction may increase accessibility for pronghorn (beneficial effect). Approx. 5 acres	Beneficial Adverse	Long-term Short-term	Negligible Negligible	Localized
Change Status of North Puerto Blanco Loop Drive	Possible Future	Project will allow 2-way traffic on the first 5.1 miles of North Puerto Blanco drive and will widen the first 5.1 miles of the drive from its present 14' width to a 20' to meet the NPS standard for dirt roads with 50-200 average daily traffic (ADT). Concrete low water crossings will be installed in four major wash crossings. A small parking area (6 vehicle) with	Adverse impacts in the form of disturbance and possible movement barrier. This change in the NPB will increase human presence in vehicles and on foot in and adjacent to the project area and in and around the Puerto Blanco Mts. Widening the road and increasing traffic on it may make the NPB a movement barrier. Some beneficial impacts may accrue, if the NPB is closed at the 5.1 mile point from Feb 15- Sept 30, by reducing traffic along the north side of Puerto Blanco Mts. However, draft Wilderness Mgmt Plan has 2 Alternatives which would also make NPB 2-way jeep trail beyond Mile 5.1. This may increase traffic in that area, which would increase disturbance. Approx. 5.8 acres of habitat loss	Adverse Beneficial	Both short-term acute and long-term, chronic effects on SHPA	Major Major	Regional

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
		adequate space to safely turn around will be constructed at the end of the two-way section near the current "Valley of the Ajo" pullout. Interpretive waysides will be installed at the drive entrance and terminus of the two-way section and at 4 pullouts. Vault toilets and picnic tables may be added at the terminus in the future if health concerns and visitor needs require.					
Inventory Dirt Roads and Evaluate Their Impact on Soils and Vegetation	Possible Future	Study the physical parameters of abandoned roads and surrounding areas to determine environmental barriers to natural recovery.	Anticipated negative impact on SPHA due to human presence. 100+ miles of closed road. 97 acres May lead to restored habitat.	Adverse Beneficial	Initial short-term acute impacts,	Negligible Minor	Regional
Highway 85 passing/turn lanes	Possible Future	At new Visitor's Center entrance area.	Effects possible, through increasing foot print of Hwy85 Habitat loss approximately 1.1 acre adjacent to already disturbed area	Adverse	Long-term	Minor	Localized
Cherioni Wash/highway 85 bridge	Possible Future	Bridge proposed for construction at Cherioni Wash - Mile 70.4 - where there is currently a low-water crossing.	Effects possible; possible disturbance effects, due to construction activity. Also, some short term habitat loss due to bypass lanes, approximately 1 acre	Adverse	Short-term	Moderate	Localized
Wilderness Management Plan	Possible Future	Draft WMP under development in '00-'01, so far with 2 alternatives in addition to "No Action" alternative."	Depending on Alternative selected, potential adverse as well as beneficial impacts. Changes in status/configuration of roads and trails, and possible establishment of new trails, could cause disturbance. Other changes in road status could reduce disturbance.	Unknown	Unknown	Unknown	Unknown
Monument boundary fence, Lukeville area	Possible Future	Possible standard barbed-wire boundary fence to be built around perimeter of private lands comprising Lukeville.	Very minor adverse impacts. Busy developed area; pronghorn would avoid area. However, this would be another fence in habitat. Approx. 3 miles	Adverse	Long-term	Negligible	Localized
Vehicle Access-Montezuma's Head	Possible Future	Members of the Tohono O'odham Nation approached ORPI requesting to use motor vehicles to cross approximately 3 miles of wilderness to access Montezuma's Head in northeastern ORPI, for ceremonial purposes.	Some adverse effects possible (disturbance/movement barrier). Although pronghorn no longer range east of Hwy85, if they were able to again this area at the north end of the Ajo Mts. May provide a movement corridor connecting to other suitable pronghorn habitat in San Simon Valley, to Vekol Valley, etc	Adverse	Short-And Long-term	Moderate	Regional
overflights	Possible Future	Low-level helicopter overflights, to interdict UDAs and drug smuggling	Overflights likely to be form of disturbance, especially low-level helicopter flights, and night flights. Effects include disturbance, physiological stress from causing pronghorn to run, etc. Possible beneficial impacts if effective at reducing illicit traffic through pronghorn habitat, etc. 200,000 acres. Approx 1 flight/month	Adverse Beneficial	Short-term	Moderate Moderate	Regional

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
Undocumented Aliens (UDAs) and Smugglers	Possible Future	Essentially an unregulated activity. Up to 500-1000 UDAs and smugglers pass through ORPI per day, mostly walking, driving, or bicycling across wilderness backcountry. By far the greatest human presence in the ORPI backcountry, resulting in new trails, new roads, rampant littering, and general resource damage.	Adverse effects through disturbance and habitat degradation. Intensive cross-country foot and vehicle traffic (>1000 people per day estimate April 2001) is likely a strong disturbance factor for pronghorn. Secondly, traffic causes habitat degradation due to trampling, fires, etc. Up to 200,000 acres. Illegal traffic has created over 30 miles of road and over 100 miles of trail. 140 vehicles/month on west side "Pozo Nuevo" road.	Adverse	Unknown, assumed to be long term	Major	Regional
Repair and Cleanup Backcountry Trails	Possible Future	This project includes repairing, vegetation trimming, water bar construction and general clean up and removal of trash from illegal campsites and along park trails.	Adverse impact due to human presence and activities. Potential beneficial impact by encouraging visitors to stay on trails. Approximately 30 miles of trail	Adverse And Beneficial	Short-And Long-term	Minor	Local, scattered
Drug Enforcement	Possible Future	Request \$5,000 for OT, and travel to provide effective special operations. Request \$5,000 for rental of a water truck four times a year to work in conjunction with heavy equipment to reduce the number of illegal drive thrus associated with the US/Mexico border.	Negative impact due to human presence and activities Beneficial impact due to reduced illegal traffic	Adverse Beneficial	Mostly periodic, short-term acute with some long-term, chronic effects	Minor Moderate	Local, scattered
Determine Visitor Use Impacts on OPCNM Resources—Undocumented Aliens.	Possible Future	A study of impacts due to UDAs on monument resources will be undertaken.	Anticipated adverse impact on pronghorn due to human presence. Area estimate not available.	Adverse	Short-term	Negligible	Regional
Stabilize Building Ruins at Victoria Mine	Possible Future	1. Remove deteriorating lime-cement mortar and tuck point interior and exterior faces of all walls. 2. Reset all loose stones. 3. Stabilize and repair door and window frames.	Anticipated adverse impact on pronghorn due to human presence. Approx 0.1 acre.	Adverse	Short-term	Negligible	Local
Photographic Documentation of NRHP Ranching Structures	Possible Future	Three ranch sites will be photo-documented - Bates Well, Blankenship and Gachado Line Camp. This archival baseline information will be used in the future for monitoring, planning, condition assessments, and reconstruction or	Anticipated adverse impact on pronghorn due to human presence. Approx 3 acres.	Adverse	Short-term	Negligible	Local

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
		stabilization efforts.					
Maintain and Stabilize Ruins and Historic Structures	Possible Future	Routine general housekeeping, IPM, annual maintenance, and cyclical maintenance will be performed to preserve and protect historic structures and features.	Anticipated adverse impact due to human presence and activities in a previously disturbed area.	Adverse	Long-term	Minor	Local, scattered
Conduct Cultural / Archeological Surveys for Approximately 20 Miles of Trail	Possible Future	Conduct cultural/archeological survey of existing 12 miles of trails which have not previously been surveyed and the proposed 7.5-mile Pinkley Peak Trail. Trails include: Bull Pasture / Estes Canyon Trail, Palo Verde Trail, Desert View Nature Trail, Victoria Mine Trail, and Baker Mine loop trail.	Anticipated negative impact on SPHA due to human presence. 20 miles of trails.	Adverse	Short-term	Negligible	Regional
Human use effects on cactus ferruginous pygmy-owl: reproductive and behavioral ecology	Possible Future	A research study will provide information on behavior and reproductive ecology of the CFPO.	Anticipated negative impact on SPHA due to human presence. Approx. 600 acres	Adverse	Short-term	Negligible	Regional
ARPA	Possible Future	Work will involve initial GPSing, mapping, and monitoring of 15 archeological sites that are at risk within the monument.	Anticipated negative impact on SPHA due to human presence.	Adverse	Short-term	Negligible	Local, scattered
Border Anti-Drug Interdiction	Possible Future	Park law enforcement activities to deter smuggling activity across the monument includes vehicle and foot patrol, aircraft use, and special operations	Anticipated negative impact due to human presence and activities	Adverse	Continuous-Short-term And Long-term	Major	Local
			Reduced illegal traffic	Beneficial		Major	
Smuggling Prevention by Preventing Cross Border Access to Park Roads	Possible Future	Request \$10,000 for road ditch maintenance and heavy metal bollard installation near gates to prevent drug smugglers from driving around gates and across the desert from Mexico onto roads that parallel the international border with Mexico.	Anticipated adverse impact due to human presence and activities in a mostly previously disturbed area. Habitat loss less than 1 acre.	Adverse	Periodic with short-term acute effects and some long-term, chronic effects on SPHA	Moderate	Local, scattered
			Reduced illegal traffic	Beneficial		Moderate	
Cost of Collection – Operations	Possible Future	This project consists of collecting fees through the sales of	Anticipated negative impact due to human presence and some habitat removal. Less than 0.1 acres.	Adverse	Short-term acute impacts during	Negligible	Local, scattered

Action	Timing of Action(s)	Description	Impact on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
		single entry permits at four (4) self-service "Iron Rangers" pipe safes.			construction,		

**Appendix D. Impact Analysis for Specific NPS Actions in the 1997 General Management Plan's
New Preferred Alternative (Alternative B)**

	Project Title	Project Description	Location	Impacts on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
1	Wilderness Management Plan	Develop Wilderness Management Plan, including establish use capacities and activities related to park management and research	OPCNM	Unable to determine; possibly both adverse and beneficial, depending on specifics of plan. Impacts would likely be in the form of either increasing or decreasing disturbance caused by human presence in backcountry and on remote scenic drives.	Unknown	Long-term	Various	Regional
2	Name Change	Seek designation as a national park	OPCNM	Possible beneficial impacts due to increased funding and management capabilities; possible adverse impacts due to increased visitation. 200,000 acres pronghorn habitat	Beneficial & Adverse	Long-term	Various	Regional
3	Manage Developed Zone	Expand and convert existing visitor center to create science, education and resources management center with adjoining interpretive center; expand maintenance facility to include Protection Division offices and to provide additional workspace and other utilities; fire station and helipad; partner with other Federal agencies for administrative office space in Lukeville; establish visitor orientation center with regional focus in Why; convert offices and dorms back to employee housing; maintain current number of housing units; establish partnership with Lukeville owner to provide apartments for seasonals and researchers; maintain current capacity at the VIP campground; reconfigure VC parking area and entrance to Puerto Blanco Drive.	Developed Zone	Adverse impacts in the form of habitat loss and disturbance, by increasing size of Twin Peaks development area and increasing potential disturbance due to increased human activity levels. Possible beneficial impacts from increased beneficial management capacity. Approx 10 acres	Adverse Beneficial	Long-term	Moderate	Local
4	Historic Property Management	Stabilize and apply preservation and use treatments for historic properties	Localized	Possible adverse impacts in the form of disturbance, due to project activities Approx 3 acres	Adverse	Short-term	Negligible	Local
5	Highway 85 Corridor Management	Acknowledge and manage for dual purpose road: maintain traffic mobility and traveler safety; determine traffic speed; manage roadside vegetation; provide 4 wayside exhibits for visitor education; provide for resource protection and conservation	North-south corridor through OPCNM	Possibly both adverse and beneficial impacts. Beneficial in the form of reducing disturbance and reducing movement barrier. Adverse in the form of increasing human activity areas at waysides, maintaining movement barrier effect, and disturbance. 22 miles of Hwy85	Adverse And Beneficial	Long-term	Moderate To Major	Linear corridor
6	Quitobaquito Springs Management	Relocate parking area; construct loop trail accessible to mobility-impaired visitors; design and install interpretive	Local area	Adverse impacts due to facilitating increased human use of area. Beneficial impact due to improved management of human activity and vehicles in area	Adverse And Beneficial	Long-term	Moderate	Local

	Project Title	Project Description	Location	Impacts on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
		signs; construct comfort station; construct road connecting the South Puerto Blanco Road with the boundary patrol road; expand size of management area.		Approx 20 acres				
7	Relocate Powerline Corridor	Move powerline to the State Route 85 corridor	Localized	Beneficial impacts in the form of reducing human activity (disturbance) along this corridor. Short-term adverse disturbance impacts from project activities. Approx 22 mile corridor	Beneficial And Adverse	Long-term Short-term	Moderate	Regional
8	Sonoran Pronghorn Management	Study impacts of highway traffic volume and speed on pronghorn; reduce impacts of highway; educate visitors about impacts of highway; monitor and restrict human use and access to minimize disturbance to pronghorn.	OPCNM	Beneficial impacts in the form of reducing disturbance caused by human activities, and possibly by reducing movement barrier effect of Hwy85. 200,000 acres pronghorn habitat, 22 miles of highway	Beneficial	Long-term	Major	Regional
9	Alamo Canyon Campground	Study impact of adding additional campsites; delineate day use parking area.	Local	Very small adverse impacts due to disturbance due to increased human activity. Area not currently used by pronghorn, but probably was historically (pre-Hwy85).	Adverse	Long-term	Negligible	Local
10	Trails	Maintain existing trails: Arch Canyon, Estes Canyon/Bull Pasture; Alamo Canyon; Old Ajo-Sonoyta Road; Grass Canyon-SR85; Desert View; Desert Discovery (VC). Add foot trails: Desert Garden Loop (near Highway 85); Grinding Holes Trail (near Highway 85); Puerto Blanco Loop; Bonita Well Trail; Twin Peaks Trail; Diaz Spire Loop; Alamo Canyon Trail extension	Scattered throughout OPCNM	Adverse impacts in the form of disturbance, due to facilitating human activity in pronghorn habitat. Potential beneficial impacts if human activity can be concentrated in non-sensitive areas.	Adverse And Beneficial	Long-term Short-term	Moderate	Local to Regional
11	Abandoned Mine Lands	Maintain safety fences and signs; close and restore selected mine and well sites.	Scattered throughout OPCNM	Beneficial impacts by reducing potential mortality due to pifall hazards. ≈400 mine features	Beneficial	Long-term	Moderate	Regional
12	Land Acquisition	Acquire 2 sections of State Land (Growler Wash/Bates Well and Dos Lomitas)	Local	Beneficial impacts in the form of preserving habitat. 1280 acres	Beneficial	Long-term	Moderate	Local
13	Vegetation Management	Control non-native vegetation; revegetate disturbed areas; monitor and mitigate impacts of woodcutting	OPCNM	Beneficial impacts in the form of habitat restoration and protection. Area estimate difficult, but exceeds 20,000 acres	Beneficial	Long-term	Major	Regional
14	Wildlife Management	Study effects of poaching; control non-native animals (e.g. cattle)	OPCNM	Beneficial impacts in the form of reduced mortality and reduced competition; impacts minor because poaching and trespass grazing are currently minor	Beneficial	Long-term	Minor	Regional
15	Inventory and Monitoring	Inventory plants and animals; monitor land use trends; monitor special status birds, mammals and plants; monitor reptiles, nocturnal rodents, climate, vegetation structure and diversity, post-grazing	Scattered	Adverse impacts in the form of disturbance. Potential beneficial impacts in the form of better management due to better ecological information	Adverse And Beneficial	Short-term Long-term	Minor Moderate	Local Regional

	Project Title	Project Description	Location	Impacts on Sonoran Pronghorn	Impact Type	Impact Duration	Impact Intensity	Impact Context
		recovery and invasive plants; water resources.						
16	Aircraft Overflight Management	Monitor overflights; assess impacts on resources and visitors; work with military to reduce impacts.	Widespread	Beneficial impacts in the form of reduced disturbance, if effort is successful	Beneficial	Long-term	Moderate	Regional
17	Miscellaneous	Develop user capacities and maintenance standards for non-wilderness areas (e.g. scenic loop drives).	Loop drives and developed areas	Beneficial impacts in the form of decreased disturbance and decreased movement barriers, if user capacities place pronghorn conservation as high priority	Beneficial	Long-term	Moderate	Regional

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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